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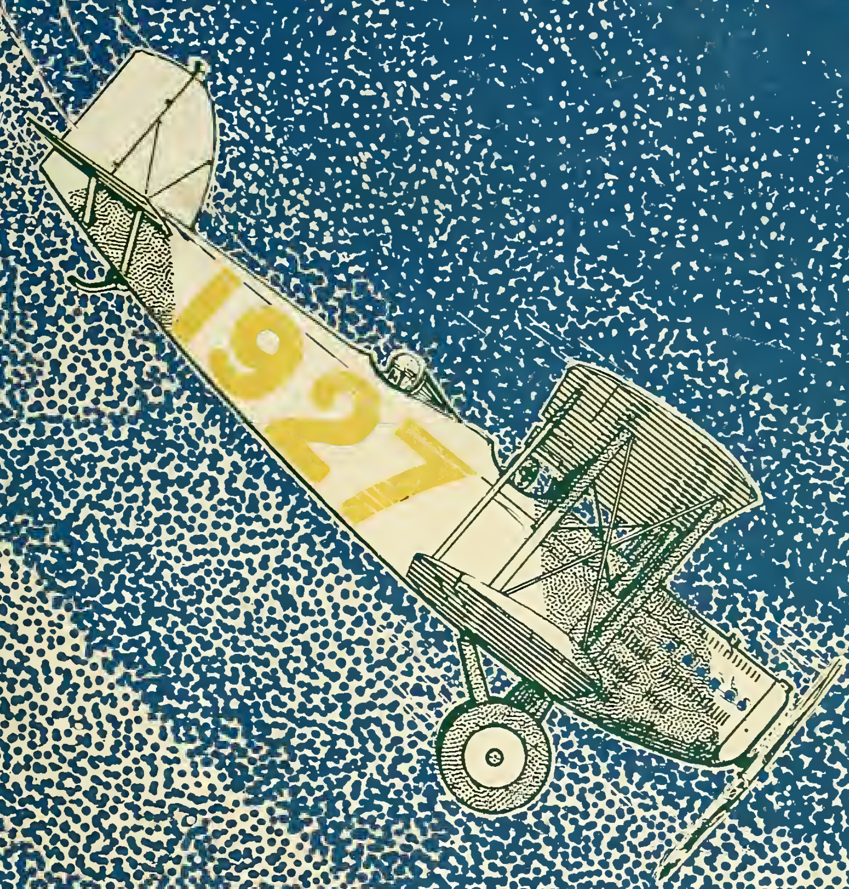
Vol. X No. 1 JANUARY 1927 25 CENTS

AERO DIGEST



NEW AIR REGULATIONS
Complete Text of Air Rules

A SINGLE DEPARTMENT OF NATIONAL DEFENSE
Congressman McSwain

WHILE AMERICA SLEEPS
Cy Caldwell

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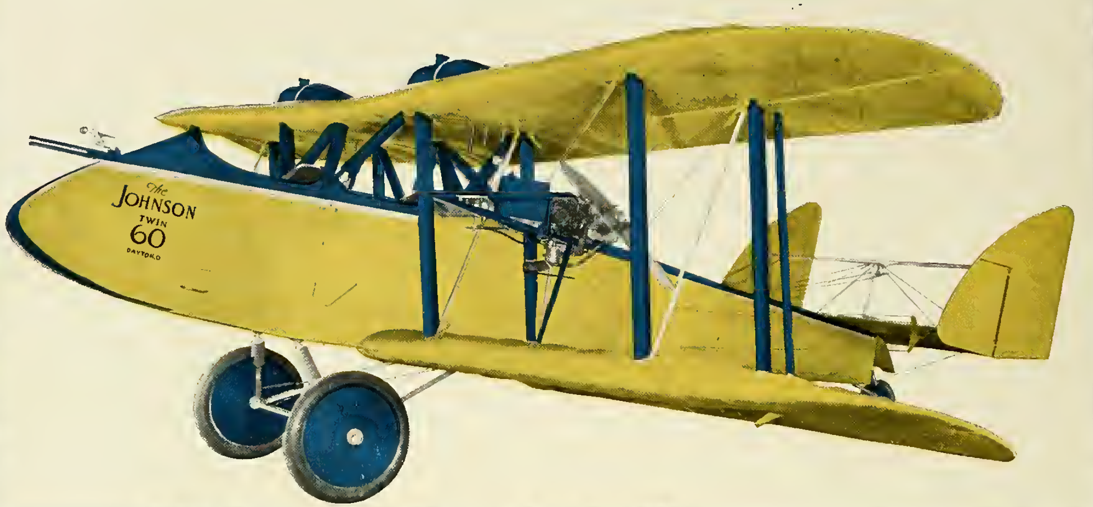

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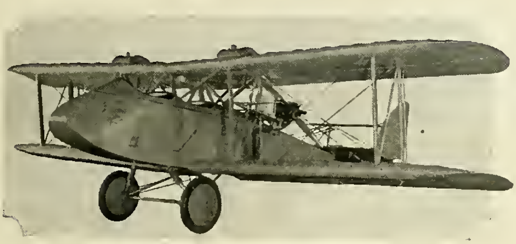

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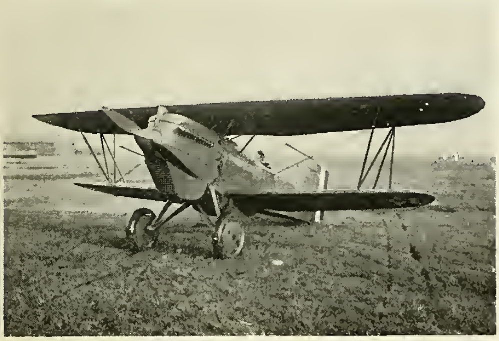

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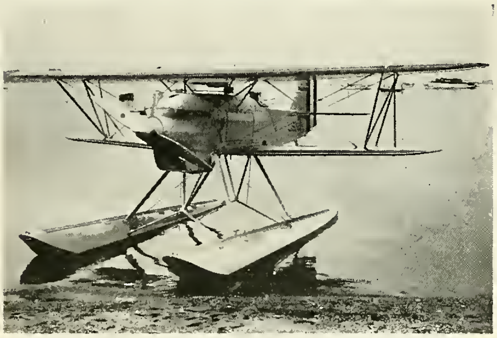
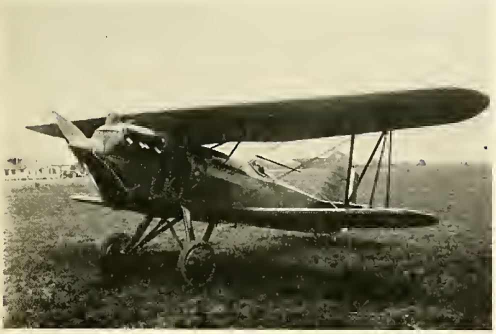


CURTISS F6C-3 "HAWK." NAVY SEAPLANE. CURTISS D-12 MOTOR.



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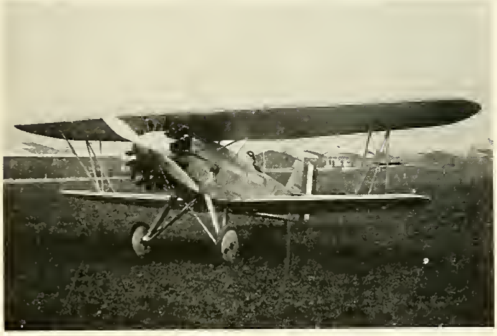

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AERO DIGEST
THE MAGAZINE OF THE AIR
Vol. 10 No. 1 JANUARY, 1927

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Phone: Wisconsin 3771. AERO DIGEST Cable Address: AERODIG.

is published monthly by
THE AERONAUTICAL DIGEST PUBLISHING CORP., 220 West 42nd Street, New York City

Frank A. Tichenor, President.
A. Horsfall, Vice-President.
K. Healy, Secretary.

J. E. Horsfall, Editor.
George F. McLaughlin, Associate Editor.
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PHILADELPHIA OFFICE: 1013 Commercial Trust Bldg., S. E. cor. 15th and Market Streets. Phone: Rittenhouse 3247.

Single Copy 25c. Yearly Subscription $3; Canada $3.50; Foreign $4.

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Entered as second-class matter July 17, 1922, at the Post Office at New York, N. Y., under the Act of April 3, 1879. Copyrighted, 1927, by Aeronautical Digest Publishing Corp.

WHILE AMERICA SLEEPS!

"The American Fleet now was spread over a large area of sea . . . A fifth squadron of Asiatic airplanes appeared flying low. They circled over the helpless fleet, dropping bombs."

WHILE AMERICA SLEEPS!

By Cy Caldwell

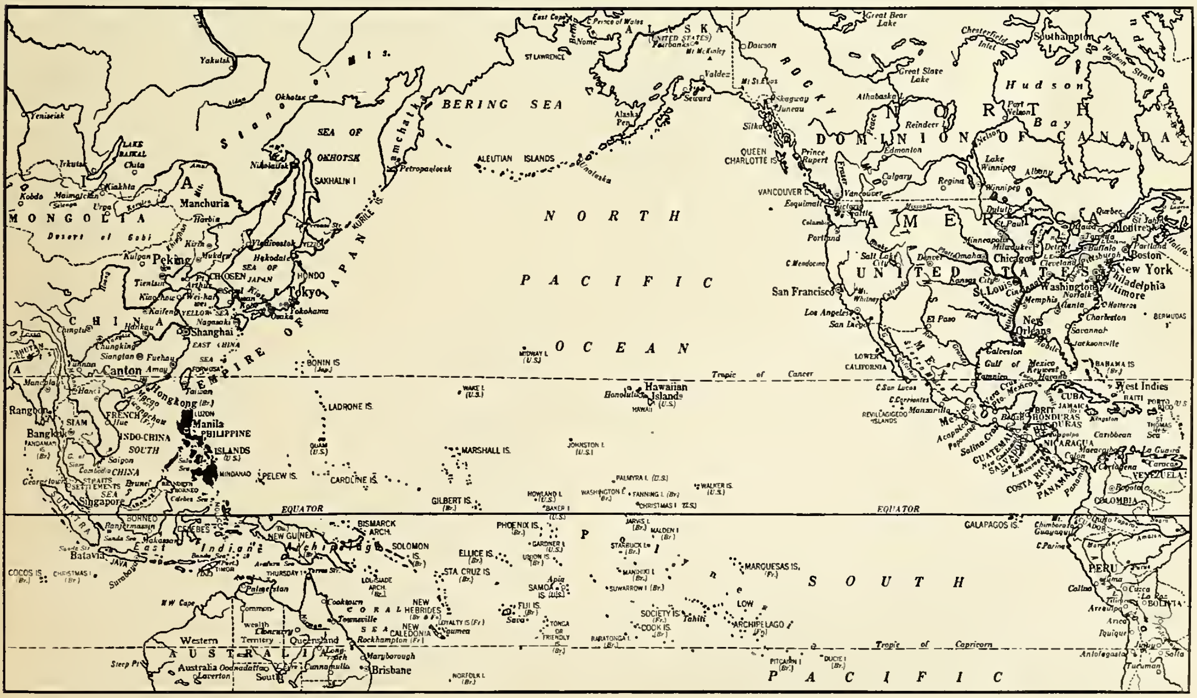
HONGKONG, Dec. 15, 1930. —(*By cable via London to* AERO DIGEST.) The American Asiatic Fleet has been captured practically intact by air and sea forces of the Imperial Asiatic Republic on the morning of December 14, according to accounts of Captain Forsythe and officers of the English freighter *Berkshire*, which docked here late to-night. The American Fleet was put completely out of commission by gas attacks from the air, and it is thought that few members of the crews remain alive. The standard gas masks apparently proved to be pervious to a new gas used by the Asiatics. The fleet surrendered without firing a shot, except from their anti-aircraft batteries in the earlier part of the action. This fire did no material damage to the Asiatic aerial squadrons, which flew at a height of approximately two miles. Upon the conclusion of this gas attack the helpless American vessels with their crews either dead or dying were boarded by sailors from Asiatic destroyer squadrons, who took possession, encountering no resistance.

The freighter *Berkshire* was proceeding to Hongkong through the Bashee Channel, which lies between Formosa, the most southerly Japanese possession, and Luzon, the most northerly Philippine Island, toward the southwest end of which lies Manila, when it met the American Fleet, which was steaming in an easterly direction. The day was very warm, the sky cloudless, the sea motionless except for a slight ground swell. The *Berkshire* was approaching the fleet, to pass a mile or so to the north of it, and was yet some four miles distant when its officers noticed four squadrons of airplanes, some eighty planes in all, flying from the north. There were two squadrons of twenty planes each at a height of some 9,000 feet, evidently large bombers, convoyed by two squadrons of smaller planes of the pursuit type flying a thousand feet above the bombers.

The aircraft passed over the *Berkshire*, and, as they approached the American Fleet, the bombers formed into four lines of ten planes each and flew over the line of battleships, cruisers, destroyers, submarines and tenders, dropping gas bombs which exploded upon impact with the water, the gas billowing upward and outward in fan shape until a space of sea perhaps half a mile wide and two miles long was covered with a screen of yellow smoke. At the end of the line the aircraft turned and came back, continually dropping bombs, the gas from which mingled with the smoke from the vessels, obscuring from view the entire fleet.

Several small attack planes had been released from the American ships upon the approach of the bombers which they attacked boldly, aided by vigorous fire from anti-aircraft batteries. The Asiatic pursuit planes, however, engaged the Americans hotly, outnumbering them by six to one. No more than a dozen planes had been released from the fleet, and of these the only ones to engage the enemy were those which had got away first. Others, released during the first part of the gas attack, flew for a few minutes or seconds, then crashed into the sea, their pilots overcome by gas. The six or seven American planes that attacked the enemy battled valiantly, shooting down four and perhaps five of the Asiatic pursuit planes and three of the large bombers before they were themselves shot down. The officers and men of the *Berkshire* were warm in their praises of the American flyers who battled gamely against impossible odds until the last one was killed.

The *Berkshire*, meanwhile, had been turned north and headed into the wind to escape the gas, a maneuver that the American fleet also attempted though with no success. For although the course was changed and the vessels spread over a wide area, the bombers continued to circle overhead, dropping gas bombs, some on the ships, others



© Hammond Map Co.

The United States is 7164 miles from the Philippine Islands. Formosa is only 210 miles from the Philippines.

in the sea and in the path of the vessels. A cruiser or a destroyer would appear for a moment, headed out of the curtain of death, only to meet and be enveloped in a new burst of gas. This action continued for some twenty minutes, at the end of which time the leading vessel of the fleet was only a short distance behind the fleeing *Berkshire.* The fleet's anti-aircraft batteries, which had been active in the earlier part of the engagement, were now silent, the gun crews having fallen victims to the gas. For many minutes not a shot had come from the American fleet, the only sounds that reached the *Berkshire* being the dull explosions of the bombs and the continual drone of motors. It was noticeable that the bomb explosions were none of them the bursting of explosive bombs, properly speaking. The amount of explosives they contained was only sufficient to burst the gas container, and thereby release the gas on the surface of the water. Such ships as the *Berkshire's* officers were able to examine through telescopes after the bombing ceased did not appear to be damaged in any way, and are in perfect shape to be added to the Asiatic Fleet without a penny spent on repairs.

The American Fleet now was spread over a large area of sea. Some were motionless, others were steaming ahead. But it was noticeable that none of them were under control. Several were steaming in circles, coming near to each other, veering off again. Less than a mile from the *Berkshire* two destroyers were steaming at full speed on converging paths. They collided, the sharp bow of one cutting through the other abaft the funnels. There was a burst of steam as the waters rushed into the fires, and when that cleared away one of the destroyers had disappeared and the other was observed to be in a sinking condition.

A fifth squadron of twenty Asiatic airplanes now appeared flying quite low. They circled over the helpless fleet, dropping bombs that exploded underneath the water. Their targets were the American submarines, some of which had dived at the beginning of the engagement. Others had not been so fortunate, for two were visible on the surface, motionless. Nor was the position of those which had submerged much safer. As the day was sunny and the sea almost completely calm, the submarines were clearly visible to the bombing planes which circled around over a wide area dropping bomb after bomb. Two were dropped just south of the *Berkshire,* soon after which the officers noticed a large and widening patch of oil on the surface of the water, indicating that a bomb had destroyed an American submarine. In no case were the bombs dropped upon surface craft, whether still or moving.

A smudge of smoke on the horizon slowly materialized into a squadron of Asiatic destroyers, which scattered and ranged alongside the helpless American ships, putting crews aboard. Many of the vessels were yet steaming about aimlessly. The *Huron,* flagship of the fleet, plowed past less than a cable's length from the *Berkshire,* displaying to the English seamen a view of decks literally carpeted with motionless bodies. It seemed as though in their frantic struggles for air, as the gas seeped through the warship, the men had rushed out on deck, falling in the death throes, and lying where they fell.

An Asiatic destroyer ranging alongside the *Huron* suddenly lifted in the center in a great burst of steam and smoke, ripped apart as though it had been snapped by a giant hand, and fell back into the sea, sinking almost instantly. It is thought that this was the last torpedo attack of one of the American submarines, for a moment later two Asiatic airplanes ranged the sea for half a mile around the spot where the destroyer had gone down, dropping bombs which exploded below the water, until in a little while the telltale patch of oil appeared on the surface. Another Asiatic destroyer several miles away blew up and sunk, probably after a torpedo attack from an American submarine. Whether or not any of these submarines escaped is not known, though it is hardly probable that even one did, for the visibility was perfect for underwater bombing.

This sea battle, the first of its kind in the history of warfare, is remarkable in that no surface craft fired a shot at any other surface craft. The one fleet was rendered noncombatant by gas attacks from the air, and delivered practically intact into the hands of the enemy. Even the submarines which were impervious to gas attack while under water, were not dealt with by surface craft, but were destroyed by depth bombs dropped from airplanes. They could not be captured but were destroyed. The Asiatic naval vessels took no part in the engagement, but were used solely to transport salvage crews to the captured American ships.

The *Berkshire* was boarded by a party from an Asiatic destroyer, its papers examined, and its radio rendered inoperative, after which it was allowed to proceed to Hongkong. As the *Berkshire* left the scene of battle, the Asiatic destroyers were headed southwest, perhaps to Manila, while the captured American fleet steamed northeast in the direction of Japan.

The cable between Manila and Hongkong has been out of commission since the morning of December 14, and no radio reports have been received from the Philippines. Your correspondent has chartered a flying boat and will arrive in Manila to-morrow morning, as the distance is 640 miles.

MANILA, Dec. 16, 1930.—(*By cable via Gaum and Honolulu to* AERO DIGEST.) The Philippines were captured and occupied by air and sea forces of the Imperial Asiatic Republic during the morning and afternoon of December 14. After gas attacks on the island towns Asiatic marines and soldiers were landed, and took possession without the firing of a shot. Manila is now a shambles. Thousands of dead and dying fill the streets and houses. The more important towns of the islands each has its large quota of dead, in some towns more than half the population.

The number of fatalities in Manila cannot yet be estimated, and of those still alive but suffering from gas burns hundreds and probably thousands will die. The gas used appears to have been a further development of Yperite—mustard gas—but several times as intense, and able to penetrate the standard American gas mask, which is unchanged since the last war. After the aerial gas bombardment ceased Asiatic troops were landed, clad not only in gas masks but in rubber gas-resisting suits, similar to those worn by divers. This possible development of gas-resisting clothing had been foreseen by the Chemical Warfare Department of the U. S. Army but no provision had been made to meet it.

The first warning of the attack on Manila was received by radio from the U. S. Asiatic Fleet, then engaged in repelling an attack by enemy aircraft, as the message stated. No further word was received from the fleet, and the message was regarded as a hoax. Then, at about 2 p. m. the first squadron of airplanes appeared from the north flying at a height of about 10,000 feet. There were twenty planes of the large bombing class, escorted by a squadron of pursuit planes, which took no part in the ensuing action, for Manila is undefended by American airplanes.

(*Continued on page 62*)

A SINGLE DEPARTMENT *of* NATIONAL DEFENSE

By John J. McSwain, M. C.

Congressman McSwain, lawyer by profession and Commander of Company A 154th Infantry during the World War, was elected by South Carolina to the 67th Congress and reelected to the 68th, 69th, and 70th. He is a member of the Committee on Military Affairs.

During 1927 AERO DIGEST *will offer its readers a very notable series of articles by United States Senators and Congressmen who are thinking earnestly and intelligently about the national defense problem of which, of course, as is recognized by every progressive nation in the world, aeronautics forms the most important detail. The right adjustment of America's aircraft plans to the nation's needs for protection is a matter of the utmost importance to every citizen and of vital moment to the aircraft industry.*

THE great efficacy of air power in prosecuting war is now universally recognized. Many with vision foresaw six and seven years ago the revolutionizing power of air combat in military matters and began to agitate for increased power and resources for the air forces in procuring and maintaining adequate national defense. At first the number of such prophets was small but they rapidly received recruits and today it is impossible to provoke an argument with military or naval authorities over the great value of air weapons in warfare.

Recognizing the vast significance of this radical change in fighting instrumentalities, many of the special friends of the air forces early advocated setting up a separate and independent Department of National Defense specially charged with air fighting agencies. The arguments for such separate and independent departments were very strong. Manifestly, the air is as different from both land and water as the land itself is different from water. Furthermore, the airplane can fight in the air above either land or water, whereas, the battleship cannot fight upon land, nor the army upon the water. Upon the face of the argument, there seems stronger grounds for an independent and self-sufficient air organization than there was for either a separate naval establishment, or a separate army establishment.

Perhaps the force of this argument would have prevailed except for the danger manifest from a logical application of the same proposition to other highly important fighting factors. For example, the industrial instrumentalities in conducting war, such as were mobilized by and under the War Industries Board during the World War, are essentially and logically separate and distinct functions from either land fighting, water fighting, or air fighting. Therefore, the argument could have been made, and probably soon would have been made, to set up an independent Department of Industry, or of Industrial Mobilization, with its head as a member of the cabinet, in the same way that the head of the War Industries Board was a member of a very important advisory committee that met once each week with President Wilson during the World War, and called by complimentary phrase "The War Cabinet." It is thinkable that in the future other fighting forces could have been operated and would have called for separate departments. Perhaps the ether may soon become a great medium of combat as it is now a great medium of intercourse. If the ether ever becomes an agency through which destruction may be accomplished, then it will be, perhaps, the greatest combatant factor in existence, and, by the same token, call for a separate department, such as the "Department of Military Ether."

This logic made it manifest that a separate and independent department should not be established for the procurement, training and combat of air fighting instrumentalities. For that reason there was set up an Air Corps in the War Department, and greater independence and authority conferred upon the Air Service of the Navy, so that the grievances complained of by the Army and Navy personnel engaged with aeronautics were allayed at least in part. Certainly greater efficiency will and must result from the legislation of the last session of Congress along this line. I have great confidence in the possibilities of development insured by enlisting the inventive genius of America in the aircraft industry. By increasing the principle of competition from the time the first line is drawn in designing until the last lick is struck in actual construction of airplanes, the benefits of competition are preserved. Publicity is insured at every stage. The man with brains and genius, even though he be poor and without financial backing, and without influential political friends, may still have the product of his engineering skill considered, and, if his ideas be superior, have the assurance that they will be accepted and that he will receive financial reward for his effort.

But in connection with the question of strengthening and developing aircraft in the Army and the Navy, there naturally and logically develops the whole problem of national defense. There was no escape from the suggestion to a logical mind that if it were unwise to add another independent department, with a Secretary of Air in the Cabinet, because such increase would multiply confusion and surely involve chaos amongst the forces for national defense, then why not accept the other alternative and consolidate all the fighting agencies of the nation under one single Department of National Defense? If three separate and independent departments are too many, then why are two such separate departments also not too many? If the air, as a fighting element, be entirely separate and distinct from both land and water, and yet does not deserve a separate department, why should there be separate departments for the forces fighting on land and water?

These questions go to the heart of the matter, and, through arguments such as (*Continued on page 73*)

AIR—HOT AND OTHERWISE

Propaganda Boomerangs
Unfair and Wasteful Competition
A Plane in Time
General Patrick Tries Again

Frank A. Tichenor

ADMIRAL MOFFETT, head of the Bureau of Aeronautics, it is well to remember is the same gallant old salt sea dog who has appeared before the President's Aircraft Board, the Lampert Committee and, indeed, every official group, with all his ensigns flying and all his big guns aimed at every proposition for a unified air force.

The Admiral (may his shadow never grow less nor his burdens heavier) apparently does not read the statements emanating from the propaganda bureaus directly under his extremely well shaped nose, for inadvertently he has given one of the strongest possible arguments for a unified air service while broadsiding against it. His is an argument appealing to the taxpayer and voter. Read, for example, the following sent out from the Third Naval District Headquarters:

"Through the adoption of the particular type training plane above referred to, an Army type further developed and adapted to Navy needs, and through tying in the Navy orders along with the Army's production program a price was obtained which, it is estimated, represents a saving of $62,800 over and above the figure which the Navy would have had to pay except for this coöperation with the Army."

He also states that during 1926 economies of construction through standardization and parts aggregated $20,000 and were progressive, that is, of the sort that will increase as time goes on.

Eighty-two thousand and eight hundred dollars is no bagatelle to the average citizen. It would buy a lot of Fords, many radios, thousands of silk socks for William or slippery stockings for the flapper daughter; but—

The Air Services will be our mainstay in the next war, with the Army and the Navy serving as servants to them. It should be against the law for such great men as admirals to mention sums as small as $82,800 when seriously reporting upon matters as important as America's air defense.

But as long as our air effort is split up as it is now we must consider its finances at retail. Doing so permit me to remark that on the first day of a unified air force savings for the first year due to the consolidation would be indicated totalling many times the sum which so delights the Admiral.

Pennies saved in this way are not pennies earned though the proverb probably holds true when applied to coin left in a workman's overalls after he heroically has passed a blind pig without tarrying. Pennies saved in connection with our aeronautics do not add to national wealth any more than shingles saved upon a leaky roof are true economy. They may be used for burning or for spanking purposes (if the saver has a family of modern girls or boys) in nice, fair weather, but if put to such insignificant utility they will be missed when comes the rainy day.

If all the air services were linked into one department under the supervision of a full cabinet officer, a good businessman as well as a good patriot, millions might be saved in a true sense; they would be spent by Uncle Samuel, but the nation would get value for its money.

That is true economy. Stop waste of every sort, but spend like wise and sober sailors upon the very best modern aeronautical material providing at the same time, a worthy and sufficient personnel to use it.

IF the admirals of the Navy wish to train their heavy guns on wasteful practices let them aim them (for example) at the Naval Aircraft Factory in the Philadelphia Yard. Here may be found not only waste of good material, rent, upkeep, personnel and all the rest of it, but of tremendous effort which, if devoted to reasonable purposes, might be of mighty value to the nation.

Further this factory as operated is unfair competition with those aircraft manufacturers who must be encouraged, not punished, if we wish aviation to advance in the United States. Washington, D. C. is called the "city of magnificent distances"; it really is the city of short memories. Already the lessons of the war have been forgotten at the Capitol, especially its confirmation of the Washingtonian maxim: "In time of peace prepare for war."

No safeguard against war, no preparation (we all know it will come of course) could be more effective than encouragement of commercial aviation by giving orders to those manufacturers who patriotically stick to it despite every shock. Navy Yard competition with them is unfair. By operating a factory such as that of which I speak are achieved no good objects and two bad ones; the latter being waste of public money and a vicious backhand slap at the commercial aircraft industry. As with the British soldier, tersely limned in Rudyard Kipling's famous poem, so it is with the aircraft manufacturers. "It's Tommy this and Tommy that"—anything contemptuous and neglectful—while the nation is at peace, but it will be "thin red line of 'eroes" when the bullets start to fly. They'll fly in every sense in the next war and so will the men who attack us with them.

It's bad policy to leave the junking of that silly Naval Aircraft Factory at Philadelphia to enemy aerial bombs, although sooner or later, if we continue as we are, they will attend to it. The better policy would be to junk it now and use the money spent on it for the encouragement of progressive private aircraft builders so that they may stay in business, developing the art for the whole nation's benefit and, when the time of desperate need comes, being equipped and informed so that they may be of national service.

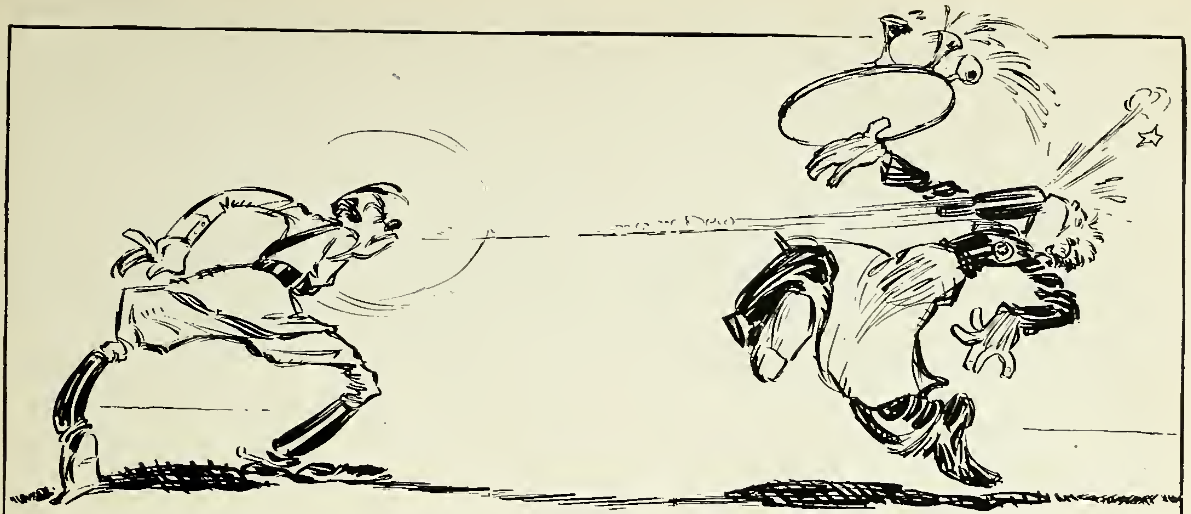
There will surely be the "thin red line of 'eroes" when the first enemy bomb is dropped upon one of our skyscraper nests.

It will be to the nation's great advantage if the 70th Congress begins bombing that Philadelphia group of wastrels without waiting for an enemy to prove to us how stupid that whole situation is.

At the present time, while aircraft development has just begun to pass out of the wholly experimental stage, such a Government enterprise as that at Philadelphia is like a cancer eating into the vitality of that national aircraft industry in which we must wholly trust when trouble comes, and which can be in such shape as to be trustworthy only if it gets encouragement from Washington by being given the orders for such new machines and fresh equipment as it can furnish more expertly and far more economically than any Government factory ever has supplied or ever will supply.

Costs? That Philadelphia factory is their old homestead. It would be interesting but it would be impossible to find out exactly what the taxpayers

(*Continued on page 71*)



James Warner Bellah

Dear Lady Editor:

Since disappearing from the Hotel Astor with half of it in his pocket and the other half thrown down the elevator shaft, "Hell's Bells" O'Neil has been seen four times with the surrounding result. If we can get enough money to pay for the embalming fluid he drank after someone took him to Frank Campbell's, we shall bail him out and get another story from him next month. The moral is that officers and men, in future, who refer to our gallant allies, the Portuguese, as "nasty little rascals" will be severely dealt with.

JAMES WARNER BELLAH.

COMPARISON OF AIRPLANES

By Dr. Michael Watter

WITH the growth of aviation and consequent varied uses of airplanes, types of aircraft are becoming so widely different as to be often noncomparable. No one would attempt to compare the performances of a fast cruiser with an airplane carrier or an armored car with a roadster. In the aviation world, however, even those well versed in aeronautical matters often make the mistake of comparing planes designed for different purposes and consequently possessing widely different characteristics. An explanation for this tendency may be the comparative youth of the airplane industry and the still remembered period when airplanes were built only "to fly"; the fact that a machine was able to stagger into the air was considered a successful crowning of the designer's efforts. This "heroic" period of struggle and courage is now past and heroes of yesterday are replaced by the more prosaic but also more efficient engineers of today.

Without going into minute analysis of the types of airplanes now in use I would like to present in a general way some of the points to be considered in comparing different machines and also to point out their relative importance.

Let us first review in general the different factors having an influence on an airplane's performance. Landing speed increases with an increase in weight and decreases with an increase of wing area. Speed decreases with an increase of wing area and head resistances and increases with the increase of power, and decrease of head resistance. The relative weight of power plant increases with the employment of several motors but this in turn increases its reliability.

Aircraft may be classified according to their purpose, and for ready comparison this subdivision is reproduced in the accompanying chart. The chart is by no means complete and its purpose is to merely list the most important types now in use. The "smaller" and "larger" craft refers to the relative bulk of the airplane and more particularly to the size of the fuselage or number of engines.

Every airplane is built to obtain certain characteristics and it is impossible to have in one plane the speed of a racer, lightness of a sailplane, comfort of a passenger cabin and reliability of a multimotored transport. The efficiency of a machine should therefore be judged solely upon how well it meets its specific requirements. This is not an axiom—merely a personal and debatable opinion. Now the fact that each machine is built to meet certain requirements reflects necessarily on its performance and it is this fact which must be taken into account in comparing different aircraft.

Larger commercial machines, for instance, must afford comfortable seating arrangements, luggage space, lavatories, etc., requiring large, spacious cabins which mean added resistance and consequently slower speed; besides this, reliability and safety of operation influence the use of multi-engined installations which detrimentally affect the pay load possible and range of operation. Cargo carriers are less bulky and may be single motored and have higher landing speeds.

Military planes are different in performance and service requirements, and, generally speaking, are faster for their landing speed is less important; but structure is comparatively stronger. Exception must be made for ambulance planes and bombers. Planes which must be catapulted are limited by a certain minimum speed which must be met by the design. Shipboard planes are usually multipurpose planes for the natural reason of economy of space which reflects upon their dimensional characteristics (for instance, the span) and so consequently on their general performance. Sometimes the difference in aircraft is plainly evident as in the case of the Wright-Bellanca cabin monoplane and the clipped wing Oriole. Oftentimes, however, differences in types are noticeable only to an engineer.

In comparing airplanes one must give consideration to the varied restrictions which had to be met by the design. Let us consider for instance a Navy Corps Observation airplane. It usually is a convertible land and water type, capable of being catapulted as a seaplane and landed as a land plane on the deck of an aircraft carrier. These requirements mean a restricted span, with chord and cell arrangement affording good visibility for general operation, spotting, gun fire, and for deck landing; the minimum speed is imposed by the catapulting condition; the arresting device requires some additional fittings and structure and the convertibility arrangement usually means a few more devices and fittings. Such restrictions necessarily adversely affect the performance in regard to speed and other desirable characteristics, and so it is unfair to compare it with a plane designed with a less

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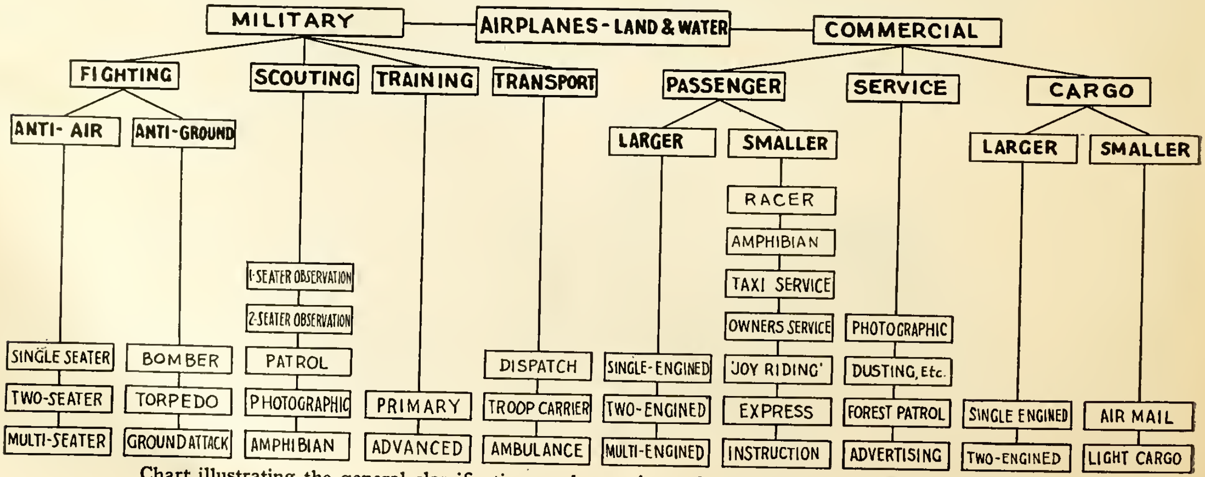


Chart illustrating the general classifications and groupings of military and commercial airplanes.

HAIL 1927 Good-bye 1926

By Ralph Cram

THERE was a sudden roar from one of the big monoplane's engines. Pilot E. P. Lott had taxied it up to the line, but was not quite satisfied with where it stood. In a moment I was rubbing my eyes, and wondering if I were "seeing things." I was sure that I had arrived on the Moline, Ill., field in a perfectly sober condition. And yet there was a two-ton airplane doing a pirouette. Pivoting on one wheel, which seemed frozen to the ground, it was describing a circle with its tailskid, much as we drew one with a compass in mechanical drawing class, back in our school days. What was the idea?

When Lott got the plane just where he wanted it, the roar died down, the plane stood still, and I came to, and realized what was happening. The answer was BRAKES, in combination with three motors.

Brakes and triple-motors are not the only outstanding developments on the commercial planes of 1926, of course, but I think Aero Digest readers will agree with me—a lay observer—that they are among the very interesting ones. Of course the triple-motored plane dates farther back. We had one, entered by Uncle Tony Fokker, in the Reliability Tour of 1925. We would have had more in 1926, but the Fokkers were too busy, and the big Ford job, like the one I saw doing circles on the grass at Moline, was the only one in the 25 planes that did the big Middle West Tour. Brakes, entirely missing on the first tour, were factors in the fine performance of half a dozen planes last summer, and it was freely predicted every plane in the 1927 Tour would wear them.

"Big Business" in the Air

Brakes and motors, en bloc and air-cooled, were not the only significant features of this stop of the big Ford at Moline. Equally interesting to us Tri-city folks on the reception committee, and to the aviation world in general, was the company of air-travelers that debarked from its cabin. In the party, most of whom were using this new mode of travel from Chicago to Dallas, Texas, and back, were these gentlemen:

Colonel Paul Henderson, former Assistant Postmaster General; Wm. B. Stout, president of the Stout Airways Corp.; Lou E. Holland, president Kansas City Chamber of Commerce; Ernest Jones, representing the Department of Commerce; H. H. Powell of Chicago, Director of N. A. T.; L. D. Seymour, Chief Engineer; R. W. Ireland, General Traffic Manager.

With Pilot Lott and H. L. Russell, engine man, it was a rather distinguished party. That it was traveling from Chicago to Texas and back, by air, was rather significant, it seems to me, of the new attitude that men of affairs in this country are taking toward air travel.

Incidentally, it was a test trip for the big Ford plane which has been bought by N. A. T., and with other types is being tried out for the combined passenger, mail and express business which planes will have to give on its lines next spring.

A Sweet Bunch of Planes

Looking back across 1926, one sees much to encourage the belief that commercial aviation made great strides during the year. We may not be near the development of air lines, nor building so many big air sedans, that they have under government subsidies in Europe, but we have not been standing still—not by a long shot.

Recalling that Reliability Tour again, with its air-cooled engines and brakes and instruments—don't forget the instruments—was there ever a sweeter lot of commercial planes assembled under American skies than the bunch that took off from the Dearborn field last August 7? It may be invidious to leave any out, but there was the Travel Air, winner; the Buhl-Verville Airster, runner-up; the Stinson-Detroiter, the Wacos, Ryan, Eaglerocks, Pitcairns, Mercury, Swallow, Fairchild, Woodson, Hess, the big Ford and Casey Jones's Oriole. Several of these names were little-heard of a year before, and those with a longer history were later models and more efficient ships than ever. No one could look over the bunch, as tens of thousands of people did at the dozen over-night and over-Sunday stops, and contend that we are not close now to the era of safe, speedy

(*Continued on page 70*)

THE JOHNSON TWIN-60 AIRPLANE

By D. Earl Dunlap

TO the professional eye the Johnson Twin-60 may appear to have been built merely to be different; but the design was evolved after considering the many problems facing not only the professional aviator, but the man who "would like to take up flying, but—" as well.

It was felt that any airplane that would enjoy the greatest popularity and utility in the United States at the present must be designed to meet existing landing facilities, or rather lack of facilities. The solution was not only to reduce forced landings and interrupted service to a minimum by utilizing multiple power plants, but to design the ship for very low landing speed, quick take-off and a good climb to permit the use of fields heretofore considered impossible.

The necessity of improving the vision from the seats over the tractor arrangement, as well as contributing to the comfort of the occupants by placing them out of the slipstream away from oil and burnt gases, was largely responsible for the arrangement. The advantages of locating the heavier weights near the center of gravity, the protection afforded the propellers, and the reduction in fire hazard were secondary improvements resulting from the arrangement.

The actual development of the Johnson Twin-60 included several minor developments that contributed to its success. Shielding the stabilizer tips with the fins reduced end loss and had the same effect as increasing the aspect ratio of the stabilizer; a new wing curve was utilized to advantage; new types of duralumin disc wheels and brakes; three point engine mount, where the entire power plant, less the gas tank, can be replaced in a few minutes; throttle controls that protect the engine from unnecessary "racing"; a tail wheel replacing the primitive tail skid; inclosed control system; new type of instrument board and new finishing and ornamental scheme.

Structural details are orthodox in character. The wings are of wooden construction, the beams routed spruce, and the ribs of the plywood truss type, the members arranged as in the Warren truss. Trailing and end edges are of tubing.

Ailerons are larger than normal due to the lower air speeds the plane is designed to fly. Control wires pass through the lower wings, connecting to the lower ailerons, with struts between upper and lower ailerons. The pulleys have ball bearings. The ailerons, due to the camber of the aerofoil, require no differential control to equalize the righting moments between up and down positions.

The fuselage structure is entirely of steel tubing with welded joints. No wires or turnbuckles are used, and the resultant framework is rigid and requires no future readjustment. The structure is reinforced by a girder beneath the door cut-out, which is large enough to minimize deflection under critical load. The door itself when locked is an added factor of safety, inasmuch as it completes the truss when in this position.

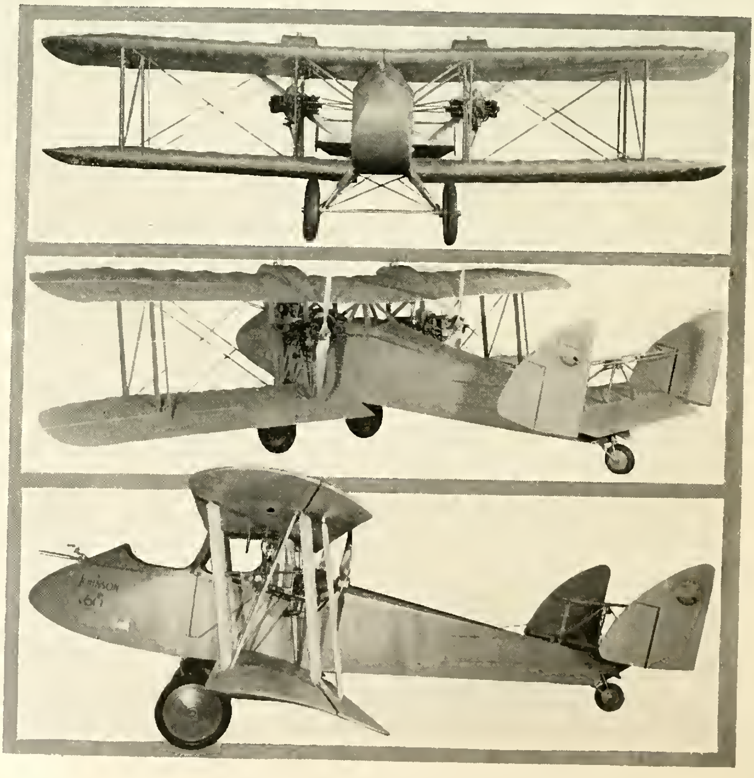
Two seats are fitted. Cockpits are roomy, and provide good visibility. There are no wires, tubes or controls exposed in either cockpit, the controls being enclosed inside the central seat rails. Dual controls are provided with features that permit their removal from either cockpit. Brake pedals, controlling the main landing wheels are within easy reach of the pilot. Map and log book cases, tool box and luggage compartment are built-in features.

The instrument board is especially designed to make a more uniform and pleasing arrangement of these items. The engine instruments are located on the engine mounts and are easily read from either cockpit; their installation with the engines eliminates the difficulties of long shafts and tubing, as well as permitting their disassembly with the rest of the power plant as a unit.

Throttle controls are installed in a manner to prevent their complete opening under normal conditions, yet allow the engines to be opened wide should occasion require full power. All throttles are located on the left side of the cockpits, and the engines may be controlled separately or in unison.

The tail surfaces are of welded steel construction, entirely within the propeller slipstreams and large enough to insure adequate control at low speeds. Rudders are balanced.

Control is light and easy. Small effort is required to secure quick response. No tendency to "float"; stable, even in bumpy air; does not build up to the "whistling" speed in a dive; and the structure of fuselage and tail surfaces has no vibration at any speed. Control in taxiing is ample; it is possible to turn the ship in its own

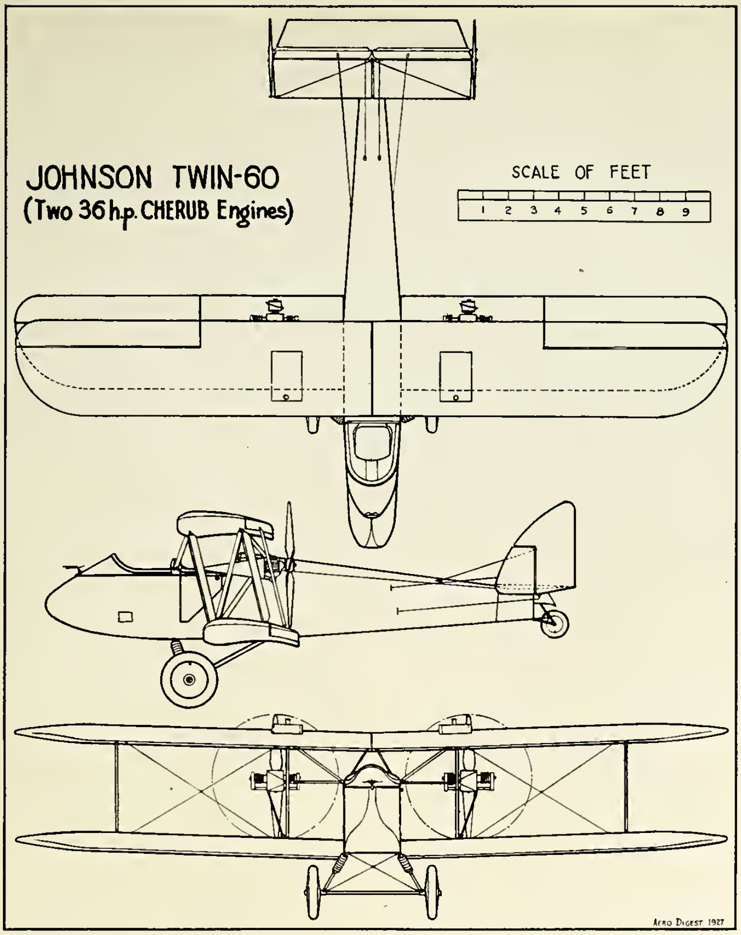


Views of the new Johnson Twin-60 light airplane.

length without use of the brakes.

Vertical surfaces are large enough to turn the ship in the air in either direction with either engine.

Brakes of new design are fitted to each wheel, controlled by the pilot's feet independently, or in unison. They are adjusted to not seize the wheels or trip the ship. As brakes are fitted, instead of the usual tail skid device in common use, a small wheel carries the tail load. This wheel casters in any direction, and is mounted on compression rubber discs.



The Johnson Twin-60 derives its name from the fact that it has two engines, totalling sixty normal horsepower. The engines are the air-cooled Bristol "Cherubs" developing 32 h.p. at 2900 r.p.m., and 36 h.p. at 3200 r.p.m. The engines have double ignition, and are equipped with impulse starters that render their starting in any weather quick and easy.

The Curtiss-Reed duralumin propellers, five feet in diameter, have ample clearance and are well protected from weeds on the ground. Due to their location, crowds on a field are not apt to walk into a revolving propeller.

The oil system, including pressure gauges, is integral with the power plant, and removable with it.

Gasoline tanks, one above each engine, carry a maximum of eight hours cruising supply of fuel. Fool-proof transparent wells indicate the fuel content at all times. Emergency supply traps are located in each tank, permitting one half of an hour's flight at full speed after the gauge shows empty. There are no pumps, the flow being entirely by gravity.

The mount is of welded steel tubing and fastened to the airplane at three points. One of the features is the quick interchangeability of power plants; the plant may be changed by two men as it weighs complete but 130 lbs., and may be tested on the ground in its own mounting.

The plane has been flown by different test pilots and with varying loads.

It has flown with one engine, with 630 lbs. useful load, over 100 lbs. more than its normal load. It has made turns in either direction on one engine, with the above load, the operating engine not turning beyond its normal r.p.m. It takes off with that load in 150 feet, and with the passenger out it took off in 75 feet. It accelerates rapidly, the plane taking off on its maiden trials in three seconds, and in landing rolled only twice its length before stopping. There is no tendency to ground loop.

The Johnson duralumin disc wheels are fitted to a straight axle type of landing gear. Transverse bracing and brake control lies in the plane of the rear struts, the front struts being fitted with compression rubber shock and rebound absorbers.

Engine cooling is ample at all speeds and all angles of flight, the engines not overheating even while on the ground. The two-cylinder engine is not a difficult nor costly item to maintain, as the parts are light, few in number and are easily understood by the ordinary mechanic. Replacement parts are kept on hand to insure no delay in keeping the engines continually in service.

The factors of safety employed in the design of the structure are those specified for Class 5 in the new regulations of the Department of Commerce—the highest factors of safety required for any class of airplane.

The principal specifications of the Johnson Twin-60 are as follows:

DIMENSIONS

Wing span	28 feet 0 inches
Height	7 feet 10 inches
Length	21 feet 0 inches
Total h.p. at 2900 r.p.m.	64 horsepower
Dihedral	2 degrees
Incidence	2 degrees
Stagger	12 inches
Gap between wings	51 inches
Wing chord	45 inches

AREAS (SQUARE FEET)

Main wings, with ailerons	194.23
Stabilizer	11.90
Elevator	12.00
Rudders	11.80
Fins	3.00

WEIGHTS

Weight empty	800 pounds
Useful load	520 pounds
Gross weight	1320 pounds

PERFORMANCES

High speed	85 miles per hour
Landing speed	25 miles per hour
Stalling speed	32 miles per hour
Range	480 miles

AERO DIGEST
Published Monthly
THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
220 WEST 42nd STREET
NEW YORK

Vol. 10 JANUARY, 1927 No. 1

THE MANUFACTURERS' JOB

AMERICA, as a matter of fact, might hop off tomorrow on a real aviation program if the industry, itself, would will that this should happen. Congress last year "authorized" 2800 fighting planes but appropriated no money for their building.

This year the right effort on the part of manufacturers could make certain that the money actually is set aside.

Indeed this situation indicates a side to the story which generally is not told.

Commercial aviation will be here when Congress gives it not only authorization but appropriations. "Moral" support has been secured for it and that is something. But now REAL support must come. There are signs in plenty that the coming Congress really will be interested; now the job is to make that interest produce hard cash instead of plaudits. That job is the manufacturers' own only.

That the Government will not get behind commercial aviation until commercial aviation makes it do so is a normal and, indeed, an admirable state of things. It is well that the American Congress should assume a show me attitude in this important matter. If the advocates of commercial aviation in America cannot do the showing then Congress will be right in a refusal to do the appropriating.

Commercial aviation can have its airways lighted, it can have its landing fields equipped, it can have whatever it requires to make it the world's greatest manifestation of business aeronautical development if and when it proves its case.

Like every other business group aircraft manufacture will get what it works for and no more. It is time, therefore, for it really to begin working.

We have highly intelligent and progressive manufacturing organizations in this country—none better anywhere in all the world—ready to spring into really worth while production as soon as they can get the signal, and they have been assured that the President is ready behind them with enthusiasm. But they will not and ought not to get the signal unless they force the hands of Congress. Anything really worth having is worth going after. If commercial aviation goes after such Congressional action as it needs it certainly will get it. If it does not, it will not.

We have the men, we have the ships and we have the money, too. Now all we need is a determined impulse. That and that alone will bring Congressional coöperation. The situation, as it stands, plainly is up to the interested manufacturers.

The President, with his messages to Congress, actually has done his share; perhaps Congress, with its authorization has done its share; now let the manufacturers and others interested do their share with a campaign of solid work to compel the transmutation of kind words into good deeds. When they do we shall have commercial aviation in the United States.

Why not make this the objective for 1927 and all work to put it over?

GO UP, YOUNG MAN

CAREERS in the air will be plentiful for young Americans. And young Americans who want careers in the air should be even more plentiful. There will be magnificent opportunities, also, for those who are to serve these airmen and their associates of our immediate future—designers, expert machinists, developers of special science branches, creators of new material combinations, originators of newly efficient devices for accomplishing old purposes and discoverers of new purposes needing to be served, if America's true genius for air navigation is to be fully developed.

A few enterprising and highly intelligent minds in the United States have seen the opportunities, nay the necessities, of this situation—such men as the Guggenheims—and have encouraged or even endowed educational courses for our interested young men. There should be more generosity and development of this kind in prosperous, progressive America and a young man for every chance.

There should be a greater number of young Americans realizing the magnificent possibilities of air navigation or some of its associated interests as the one most promising field for interesting, useful and prosperous careers. The air offers opportunities for technicians of types quite as high as those of medicine; it offers chances for mechanical genius, metallurgical skill, pathfinders in a dozen scientific fields which now are wildernesses, besides a means of securing a competency by effort in a sphere which is at once well paid, fascinatingly interesting and possessed of that spice of adventure which so appeals to American youth.

In order that those who wish to enter this field may be able to secure reliable information as to its opportunities, we have compiled a list of available openings. This file is at your disposal without charge.

1927

OLD 1926 has been a pretty good year.
1927 must be the biggest year so far.
For that will insure still bigger years to come.
What's needed is
No whispering gallery
No internal quarrels or unfairness—but—
Straight from the shoulder fighting for the Great Idea
Which is making the United States air-minded.
The Lord helps those who help themselves and team work
Does it.
Play the game
AND WIN!

WHY DO THEY RESIGN?

GENERAL PATRICK realizes and complains of the number of resignations from the Air Corps. And he knows why the men resign. So does the young junior officer who writes as follows to AERO DIGEST:

"I have come slowly and reluctantly to the conclusion that the Air Corps holds no promise of a future for a young man of the lower ranks, whereupon I have decided to enter the civil lists and that immediately. In the civil field success may be a coy and light toed person but there will be at least the zest of the chase.

"Now, where to go? My lack of touch with things civilian embarasses me."

General Patrick begs for a separate budget and promotion list for the Air Corps. That would save the situation and do more toward our national defense than the building of a fleet of battleships—battleships which will become obsolete the moment an enemy plane flies over them, and will be junk a moment later.

A NOD AND A WINK

Follies of 1926

Glorifying the American Airplane

By

Cy Caldwell

THE Follies of 1926, glorifying the American airplane as Mr. Ziegfeld has glorified the American girl, came to an end with the old year, and has been packed away in the storehouse of memory. It was a good show, and if the 1927 production is as successful and as funny, it will be well worth the price of admission. Even if the new one isn't as funny, we won't feel inclined to censure the producers, for in 1926 the high point of flying comedy was attained—the peak load, as we big business men say here in New York. For example, it just doesn't seem possible that any act will be devised to beat the unadulterated humor of the Polar Expeditions—unless Wilkins goes up there again, or Tex Rickard stages a bout between Ellsworth and Amundsen in this corner and Nobile and his fox terrier in that corner; especially if Tex used the Cesspool-centennial Stadium that nobody knows what to do with now that the marsh land on which it stands is ready for the Sesqui promoters' real estate development plan.

But before we forget all about this great Follies of 1926 and let it slip into the past along with Queen Marie of Roumania, the Hall-Mills cross-word puzzle (the cross words being supplied by Simpson), and Aimee Simple McOrmiston and the other royalty complexes and love tangles of the old year, let us review some of the highlights of the production in an earnest endeavor to find out how many laughs were packed in one great show.

TAKE those Polar scenes for instance. Can anything beat the unconscious humor of Wilkins and Lanphier seated in an igloo at Point Barrow discussing the probability of their arriving at the Pole along in the spring of 1950, while all the time Byrd and Bennett in the Fokker and Nobile and other word pugilists in the Norge were having a race to see which would get back first to Broadway and a two-dollar-a-seat audience of simple souls, who had already read the lecture in the gnuspapers for two cents. But there were those two comedians in their igloo pounding away on their radio and sending out long press dispatches telling what a time they were having getting their motors warmed up, and how their provisions were running low—there not being more than two bottles left—and how they weren't sure if there was land up there or not, but that if they waited until some of the glaciers melted they felt sure they'd find a continent, or at the very least a small island with a polar bear on it. Of course the trouble with them was that they had no receiving set, or they'd have learned that Byrd and Nobile and the rest had been to the Pole and were back in the Waldorf Castoria discussing terms with lecture tour managers and writing their experiences at so much a word.

And what a laugh there was when in the final scene the backers in Detroit sent Wilkins a shipment of flower seeds for spring planting so he'd have something to beautify the igloo. They asked him if he wanted any winter wheat and corn so he could go into farming and make the expedition self-supporting, as they were tiring of the burden. You see, they weren't getting the advertising out of it they expected. Even the pictures of the plane were disappointing. There were the words "Detroit Arctic Expedition" in letters one inch high, and the word "FOKKER" in letters that were limited only by the size of the fuselage. That was a slick piece of advertising of Tony's, though it was probably inadvertent, for you know what a modest, retiring sort of fellow he is. In some of the pictures you couldn't see the plane at all, only the name. In fact, they had a man right there to pull people from in front of the big name and push him over in front of the little one about Detroit, whenever a photographer appeared.

Finally the Detroiters sent Wilkins a telegram, which went in by dog team, "Unstick yourself from that igloo and come back where we can talk to you. Byrd and Nobile have been back for years, have married and settled down and are baptizing their first grandchild to-morrow. Try to get back for the coming-out party of Miss Fokkerine Byrd and Miss Norgeiana Nobile eighteen years from now, but don't strain yourself." Well, Cap Wilkins was so mad he shaved off his whiskers and has never been the same man since. He suffers a relapse every time he sees an Eskimo Pie.

BUT for real comedy the Norge bunch of Roman, Norwegian and Yankee gladiators had Wilkins tied. That scene showing the cabin of the Norge as the ship was passing over the Pole was a knockout—in fact, several of the actors were nearly knocked out of the cabin. "Who's in charge of this fighting gas-bag, anyhow?" asks Nobile angrily, aiming a kick at Ellsworth just as he was cutting a few coupons off his bonds. "Amundsen is," retorts Ellsworth, throwing a bond out of the window to show he didn't care how he wasted his money on Polar expeditions. "The hell you say!" exclaims Nobile in Italian, telling his dog, Tincania, to take a bite out of Ellsworth. "Call off this Mussolini mascot," cries Ellsworth. "Can't you see I'm busy writing up a press despatch?" "Did you mention me in it?" asks Nobile. "I didn't. I'm only sending ten words, and six of them are my own name. What do you think I paid for this expedition for?" Nobile mutters a few words about the hated American dollars that all the Europeans are after, and calls Ellsworth a dollar-chaser. "And I caught up with a few," retorts Ellsworth. "That's what's wrong with you Europeans, calling us Americans dollar-chasers. You birds are still chasing and we are sitting down resting, and getting publicity. You're only sore." "I'm not sore," yells Nobile, pulling out a handful of hair to prove it. "But I hate to see you and this Norwegian herring-chaser hogging the glory. Why, until he kidded a Yankee into paying for his Pole trips that guy used to watch his breakfast come swimming up the harbor. And some mornings the fish didn't feel like swimming." This wakes up old man Amundsen. "Ay'll yump on you in a minute," he says to Nobile. "Ay ban all fed oop listening to that spaghetti."

And so it went. Even after they got back they continued the fight in all the papers—all Polar fights are fought through reporters. The scene showing Nobile, Amundsen and Ellsworth surrounded by reporters and fighting for all they were worth was simply thrilling. It killed forever the theory that the southern sun arouses the passions and proved that if you want to get real mad the thing to do is to go to the Pole, along with a bunch of people of different nationalities.

In contrast to this was the

(*Continued on page 66*)

AIR COMMERCE REGULATIONS

Department of Commerce
Aeronautics Branch
Effective December 31, 1926

A WORD FROM—

WM. P. MacCRACKEN, JR.

Assistant Secretary of Commerce for Aeronautics

In connection with the promulgation of the regulations under the Air Commerce Act of 1926, I want to take occasion to thank all of those interested in commercial aeronautics who gave so generously of their time to assisting in the preparation of these regulations. This includes not only those who attended the various conferences held by the Department, but also those who sent in written suggestions and criticisms.

It is the aim of the Department of Commerce to foster in every way possible civil aeronautics and the aircraft industry. This can best be accomplished by a frank expression of opinion, mutual confidence, and whole-hearted coöperation. This is the spirit which has prevailed in the drafting of these regulations, and I trust will continue as they are amended from time to time, and as they are administered by the personnel of the Air Regulations Division of the Department of Commerce.

Wm P. McCracken Jr,

Chapter 1. LICENSING OF AIRCRAFT

SECTION 1. Licensing Law: " 'Air Commerce' means transportation in whole or in part by aircraft of persons or property for hire, navigation of aircraft in furtherance of a business, or navigation of aircraft from one place to another for operation in the conduct of a business." (*Sec. 1, Air Commerce Act.*)

" 'Interstate or foreign air commerce' means air commerce between any State, Territory, or possession, or the District of Columbia, and any place outside thereof; or between points within the same State, Territory, or Possession, or the District of Columbia, but through the airspace over any place outside thereof, or wholly within the airspace over any Territory or possession, or the District of Columbia." (*Sec. 1.*)

"The Secretary of Commerce shall, by regulation—Provide for the granting of registration to aircraft eligible for registration, if the owner requests such registration * * *" (*Sec. 3a.*)

"It shall be unlawful * * * to navigate any aircraft * * * in interstate or foreign air commerce unless such aircraft is registered as an aircraft of the United States." (*Sec. 11a 2.*)

"To navigate any aircraft registered as an aircraft of the United States * * * without an aircraft certificate, or in violation of the terms of any such certificate." (*Sec. 11a 3.*)

"Any person who (1) violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of $500 * * *." (*Sec. 11b.*)

Aircraft means "any contrivance now known or hereafter invented, used, or designed for navigation of or flight in the air, except a parachute or other contrivance designed for such navigation but used primarily as safety equipment." (*Sec. 9c.*)

Aircraft of the United States means "any aircraft registered" under the Air Commerce Act. (*Sec. 9f.*)

2. Application of the Law: Aircraft must be licensed before engaging in:

(A) Carrying persons or property for hire or reward, or the United States mails: (1) between two or more States, or to or from foreign countries; as from Chicago to Dallas, Texas, or from New York, or Portland, Maine, to Montreal, Canada; (2) between two points in one State if a part of the flight is over another State, as from Buffalo to New York via Susquehanna, Pennsylvania; or, from Buffalo, thence over any part of Pennsylvania, and thence back to Buffalo; (3) between two points in one State if it is a part of a through carriage between points in different States, or countries, as from Los Angeles to San Francisco, California, as a part of the carriage between Los Angeles and Seattle, Washington, or from San Antonio, Texas, to Laredo, Texas, as a part of the carriage between San Antonio and Monterey, Mexico; (4) within the airspace over the District of Columbia, or any Territory or Possession of the United States;

(B) In flying between points in different States, the District of Columbia, or Territories, or Possessions of the United States, or to, or from any foreign country: (1) For the operation in the conduct of a business, as where the aircraft is used in a business in one State, Territory, or Possession of the United States, or the District of Columbia and is flown to another State, Territory, or Possession for use in the business in that State, Territory, or Possession. Applied to concrete facts it includes the aircraft which is used in State A, for exhibition purposes, or the carriage there of persons or property for hire or reward, and is flown to State B for exhibition purposes, or for the carriage there of persons or property for hire or reward.

3. Aircraft Belonging to the United States: Aircraft belonging to the United States will be licensed by the Secretary of Commerce if the operating agency so requests.

4. Aircraft Belonging to States, Etc.: Aircraft belonging to States, Territories, or Possessions of the United States, or to political subdivisions, will be licensed by the Secretary of Commerce and rated as to airworthiness in the same manner as other craft, if request for licensing is made, and such aircraft are used exclusively in governmental service.

5. Foreign Aircraft: Where civil aircraft of the United States are permitted to fly in or over a foreign country without registration and rating and licensing of their airmen, the aircraft of such foreign country, not a part of its armed forces, and the airmen serving in connection therewith, may operate in the territory over which the United States has jurisdiction, without licensing. Such foreign aircraft shall not engage in interstate or intrastate air commerce.

6. Prerequisite to License: An aircraft will be licensed after it is registered and found airworthy.

7. Registration, Meaning of: Registration means entry in an official registry of the Secretary of Commerce as an aircraft of the United States.

8. Requisites of Registry: An aircraft to be entitled to registration must be owned by:

(A) A citizen of the United States, or

(B) a partnership of which each member is a citizen of the United States, or

(C) a corporation organized under the laws of the United States, a State Territory, or Possession of the United States, and of which the President and at least two-thirds of the directors or managing officers are citizens of the United States, and of which at least 51 per cent of the voting interest in the corporation is controlled by citizens of the United States, or

(D) the Government of the United States, a State, Territory, or Possession, or a political subdivision thereof, and used exclusively in the governmental service, and

(E) must not be registered under the laws of any foreign country. (*Sec. 3a and 9a.*)

9. Airworthiness, Law of: "The Secretary of Commerce shall, by regulation—Provide for the rating of aircraft of the United States as to their airworthiness * * *. The Secretary may, from time to time, rerate aircraft as to their airworthiness upon the basis of information obtained under this subdivision." (*Sec. 3b.*)

"It shall be unlawful * * * to navigate any aircraft registered as an aircraft of the United States without an aircraft certificate or in violation of the terms of any such certificates." (*Sec. 11a 3.*)

"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of $500." (*Sec. 11b.*)

10. Airworthy, Meaning of: Airworthy means a condition meeting the minimum requirements of this chapter.

11. Airworthiness Factors: In determining airworthiness, consideration will be given to the following:

(A) The structural strength of wings, ailerons, tail surfaces, fuselage including engine mount, and landing gear; (B) Cockpit, cabin and control arrangements; (C) Power plant and power plant installation; (D) Equipment and instruments; (E) Propellers; (F) Fittings; (G) Materials and workmanship; (H) Flying characteristics and qualities.

12. Structural Strength Requirements for Airworthiness: (A) *Classification:* To determine structural strength requirements airplanes shall be classified according to gross weight in pounds, as follows: Class 1—up to 2,500; Class 2—over 2,500 to 4,500; Class 3—over 4,500 to 7,500; Class 4—over 7,500 to 13,500; Class 5—over 13,500.

(B) *Wing truss analyses and load factors:* The wing truss analyses must show high and low incidence and inverted flight conditions, and the minimum load factors, for such conditions, as when new, shall be as follows:

Class	*Incidence High*	*Incidence Low*	*Inverted Flight*	*Nose Dive*
1	6.5	4.5	2.5	2.0
2	5.8	4.0	2.2	2.0
3	5.2	3.6	2.0	2.0
4	4.8	3.3	1.8	1.8
5	4.0	2.8	1.6	1.6

(C) *Aileron and tail surface strengths:* The fixed and moveable control surfaces, as when new, shall be designed to withstand at least the following loads:

Class	Ailerons and horizontal tail surfaces lbs. per sq. ft.	Vertical tail surfaces
1	30	75% of the load required for horizontal tail surfaces.
2	25	
3	20	
4	15	
5	15	

(D) *Control System Strength:* The control system strength shall be designed to withstand at least 300 pounds pressure in a fore-and-aft direction and 150 pounds in a lateral direction, on a stick control, and 250 pounds applied tangentially, on a wheel control; and 300 pounds on the rudder or foot pedal; the forces being considered as acting at the points where usually applied by the pilot. If gearing ratios and the area and disposition of the control surfaces are such that they cannot at their maximum loading offer resistance equivalent to the above forces, the control system comprising horns, cables, pulleys, etc., between the control surfaces and the stick, wheel or rudder bar, shall be designed to withstand the forces produced on the control surfaces by loading twenty-five (25) per cent more than the loadings given in Section 12C.

(E) *Fuselage Strength:* The fuselage shall be designed for: (1) High Incidence Conditions, with the same load factors as for the wings, and under conditions of dynamic equilibrium; (2) Low Incidence Conditions, with the same load factors as for the wings, and under conditions of dynamic equilibrium; (3) To withstand the loads on the vertical tail surfaces as in Section 12C; (4) Three point and level landing, with following load factors: Class 1, Load Factor 6.5; Class 2, L. F. 6.0; Class 3, L. F. 5.5; Class 4, L. F. 5.0; Class 5, L. F. 4.5. (5) Nosing Over: The front parts of the fuselage shall be designed to resist the forces to which they would be subjected in nosing over, unless the landing gear is of such construction that the probability of such an accident is remote. To stimulate this condition, assume the airplane to be resting on the wheels and the center of the propeller hub or that portion of the primary structure of the fuselage that would strike the ground first. Assume the gross weight of the airplane to act at the center of gravity and perpendicular to the ground. The load factor required shall be that for the three point landing condition.

(F) *Structural Strength of Landing Gear:* The landing gear shall be designed to carry a side load of 1.5 times the weight of the airplane acting in either direction and applied to one wheel at its axle. The landing gear shall be constructed, as when new, to correspond in strength to the fuselage under landing conditions.

The landing gear assembly shall be designed to withstand without failure, fall of the fully loaded airplane, with its thrust line horizontal, from the heights listed below, the whole landing shock being taken on the principal wheels:

Class 1, height of drop, 24 inches; Class 2, drop, 22 inches; Class 3, drop, 20 inches; Class 4, drop, 18 inches; Class 5, drop, 18 inches.

(G) *Strength of Fittings:* The strength of all fittings shall correspond to the strength of that part of the structure with which they are incorporated.

13. Construction of Cockpit, Cabins, and Controls:

(A) The cockpit must be constructed to afford: (1) Suitable ventilation; (2) Adequate vision to pilot under normal flying requirements; (3) Reasonable protection to pilot and passengers against possible propeller breakage, and

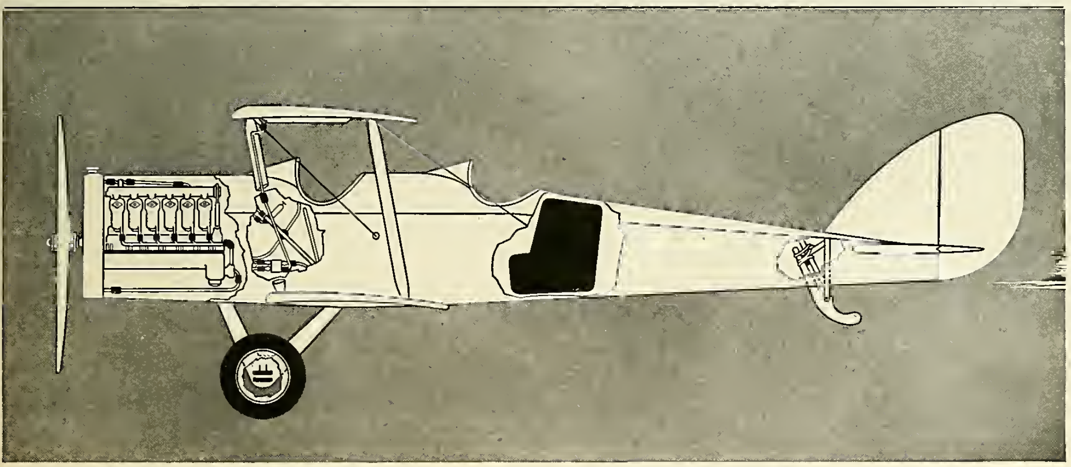
(B) Closed cabins on airplanes carrying passengers for hire or reward must have not less than two exits affording maximum ease of operation.

(C) Dual controls on airplanes carrying passengers for hire or reward shall be so constructed or arranged as to prevent passengers from interfering with the course of flight of the airplane.

14. Power Plant Requirements: (A) The power plant must be equipped with: (1) Fire wall, or equivalent protection, insulating engine section from other parts of the airplane in case of fire, and provided with glands or gaskets when pierced by pipes or wires; (2) Carburetor air intakes opening outside the fuselage, and must be suitably drained; (3) Throttle control and ignition switches, on multi-engine airplanes, arranged to permit separate and simultaneous control; (4) Suitable ventilation for engine compartments; (5) No air pressure gasoline feed system, except with special approval of the Secretary of Commerce; (6) For airplanes carrying passengers for hire or reward,

(*Continued on page 50*)

GOODYEAR PROVIDES THE RUBBER



BLACK areas show where rubber is used in airplane construction. Goodyear makes hose and molded rubber connections; tires, tubes and flaps; streamline windshields; fuel tank covers; tail skid and axle bumpers; grommets; rubber floor matting

FLAWLESS metal . . . true wood . . . stout fabric . . . and *good rubber!* These make the airplane.

Rubber tires, of course. As big as they must be. As small as possible to reduce resistance. Tough, yet light. Able to take the terrific smash of fast, or awkward landing. Able to roll to the takeoff over soft or bumpy ground. Not just tires, but *airplane tires.*

Fuel tank covers, too, that prevent splash or spray, even though the container be battered, broken, or pierced. A perfect bandage of soft, live rubber that protects against condensation, as well as accident.

Rubber washers, rubber grommets, rubber hose—to resist wear, absorb vibration, defy corrosion, or withstand extreme temperatures.

Now, the weight, texture and character of rubber must differ according to its purpose. It takes men who know rubber to make airplane equipment that will give the longest and safest service.

Goodyear makes everything in rubber for the airplane.

Aeronautics Department
THE GOODYEAR TIRE & RUBBER COMPANY, INC., AKRON, OHIO

GOODYEAR

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AVIATION EQUIPMENT

COMMERCIAL SUPERCHARGERS

By David Gregg

Formerly in charge of Supercharger Development, Engineering Division, McCook Field

THE word "supercharger" to the commercial pilot brings up shivery visions of flying at an altitude of thirty thousand feet or so, in an atmosphere as cold as that at the North Pole—for up to the present time publicity has coupled the use of airplane superchargers exclusively with high altitude flying, and the contest for the world's altitude record. True, it was for high altitude flying that superchargers were first developed, and they maintain full engine power at all altitudes used in military flying. Having succeeded in a field surrounded by all the glamor of exploring the unknown upper air, superchargers are being brought back to earth, as it were, and turned to a commercial development that is of vital interest to the civilian pilot, for the supercharger is destined to reduce the size and cost of the airplane engine, and improve the performance of the airplane in which it is used.

Consider the trend in airplane engine development. To increase the power builders have increased engine speeds and compression ratios, which, in turn, have increased the power per unit of displacement. Speeds of three thousand r.p.m. and compression ratios of seven to one have been used successfully. In spite of the additional power gained in this manner, the intake charge is still limited by the amount that the pistons can suck in at each stroke. Due to the resistance through the valves, and in the intake manifold, the charge is always less than the displacement of the piston. The ratio between the charge sucked in and the total displacement of the piston is called the volumetric efficiency of the engine. This decreases at high speeds, and a point is reached where an increase in engine speed gives no added power. The speed at which this occurs is called the peak speed. With a supercharger, the gas is forced through the manifold and valves under pressure, raising the peak speed, and increasing the power by filling the cylinders with a greater weight of combustible mixture.

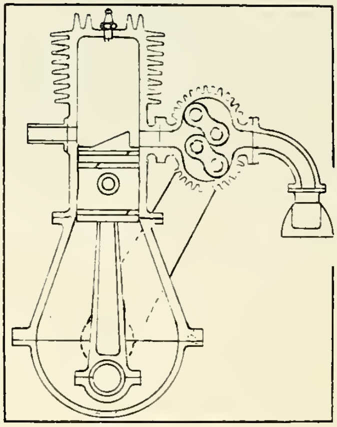
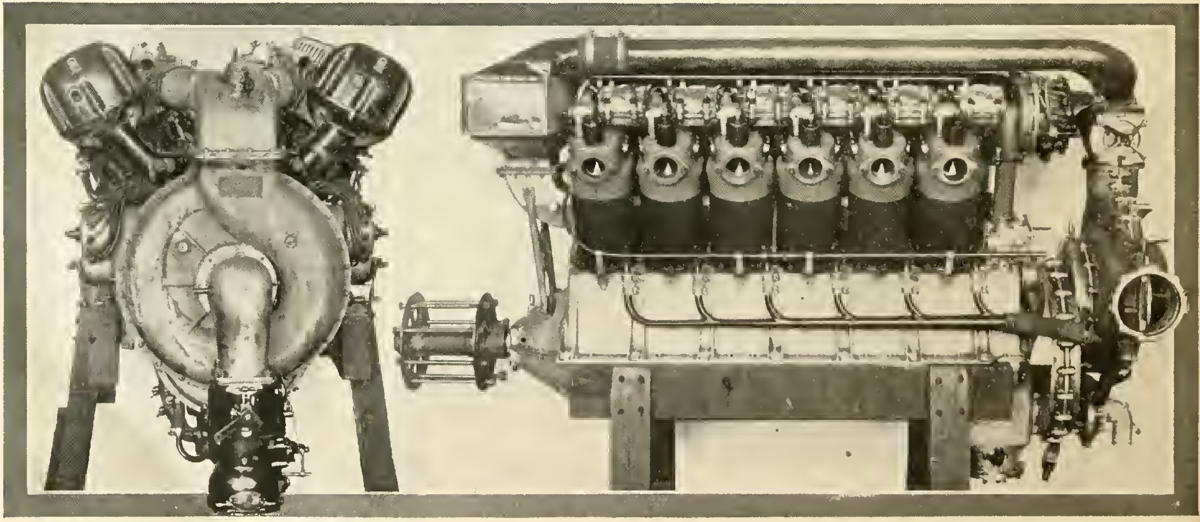


Diagram of a two-cycle engine with forced induction in the intake system and no crankcase compression.

The supercharged induction system first came to public attention through the success of the Duesenberg cars, which used this system in winning the 1924 and 1925 Indianapolis races. The system consists of a high speed centrifugal compressor placed between the carburetor and the intake manifold, by which the weight of the intake charge can be increased as desired by increasing the pressure. The fuel and air from the carburetor pass through the supercharger where the heat of compression and the rapidly revolving impeller vaporize the mixture so that a dry gas is delivered to the cylinders. As a result difficulties with distribution are practically eliminated. The carburetor throttle regulates the amount of supercharging so that with one control all speeds from idling to wide open are obtained, the design and speed of the supercharger determining the final pressure. Experience during the past two years has shown that an increase of 30 per cent in power may be obtained without altering the design of the engine, or using special fuel.

The possibilities of this new system are shown by the recent development in racing engines for automobiles. The best aviation engine in actual service gives about one horsepower for each two and one-half cubic inches of piston displacement, while a modern supercharged automobile engine gives more than one horsepower for every cubic inch! A diminutive straight eight of 91.5 cubic inches displacement giving more power than the old stand-by, the OX-5! (A 91.5 cubic inch engine with an A. C. supercharger has developed over 135 horsepower on the dynamometer.) The speed of these racing engines runs over 6,000 r.p.m. This is much too high for direct coupling to the propeller of an airplane, but as the

(Continued on page 70)



End view of the Curtiss D-12 engine and side view of the Liberty 12, equipped with standard type superchargers.

PITCAIRN

PLANES

THE PITCAIRN OROWING

$2000.00 AT FACTORY

Inquiries invited looking
to dealer representation
for Pitcairn planes.

A three place commercial plane that has established its desirability in extensive passenger service, sport use and instruction work.

Powered with OX-5 motor. Equipped for dual control.

Excellent performance with remarkable inherent stability and ease of control.

Construction incorporates numerous refinements designed for simplicity, strength and inter-changeability of parts.

The Pitcairn Orowing is the lowest priced Modern Commercial Airplane on the market.

Complete description on request.

PITCAIRN AIRCRAFT·INC·

LAND TITLE BUILDING PHILADELPHIA

THE HOUSE OF A THOUSAND NAMES

By

Louis DeJean

"Mother" Tusch and two of her "flyer sons"—Lieuts. Smith and Arnold, Round-the-World flyers.

A LITTLE street, one block long. Barred at the north end by the University of California campus. A little cottage, not very new. Vines and flowers. Under the window boxes an airplane propeller and, suspended below it, a board bearing the words, "The Hangar."

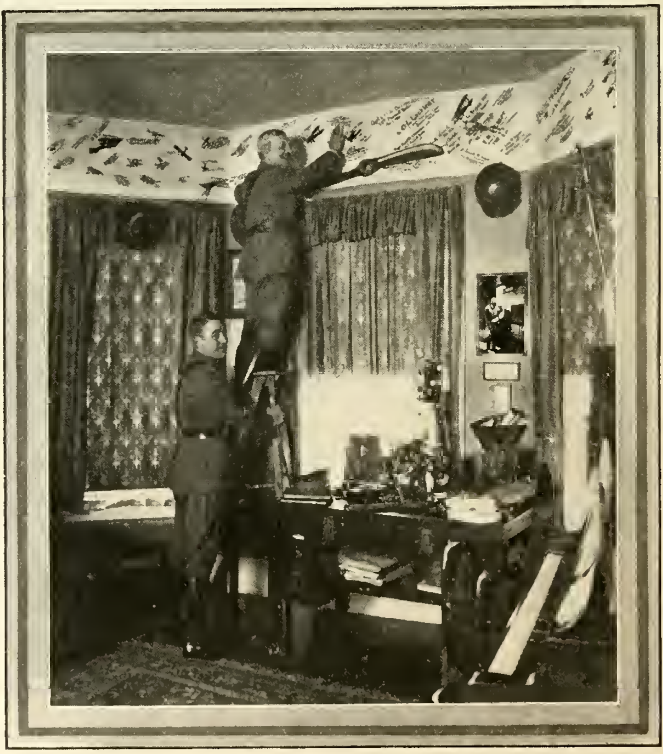
"The greatest War Memorial in America," declares Professor Bolton, noted historian of the State University. How? And why? No monument. No museum. Just a little home. And a jolly, wholesome little woman. No funeral atmosphere. No sticky sentiment. Eternal sunshine. "Mother" Tusch of the Air Corps.

Up the well-worn wooden steps. A shield by the door. Winged devil chased by a mounted knight. Ninety-first Squadron coat-of-arms. The door opens. "Hello, there, son! God bless you! Come in here. Where've you been? What have you got to say for yourself?" No gushy back-slapping. No sob-stuff here. Optimistic. Cheery. Sympathetic. Real.

"A story about The Hangar? Sure. Fine! Sit down there. Smoke up. What do you want to know? I'll keep still and let you ask questions." But "Mother" can't keep still. She is bubbling over with news about this or that one of "her boys." With inquiries about others. About yourself. It is a joy to listen while we look around for new souvenirs, new trophies, new photographs and new signatures.

There are two rooms, parlor and dining room. No door between. Parlor in front. A piano. On top and above hundreds of signed photographs. All men. Young men. In uniform. Wings and decorations. In leather coat and helmet. Under the bay windows is a writing table, piled high with albums and odd objects. Steel helmets, English, French, German, American. Lenses. Gun-sights. Trophies.

In the corner, a strange chair. Fashioned from propeller blades. Over there, another. Above a doorway into dining room, a propeller. On the walls, photographs. Group and individual. Framed and unframed. Above the molding—ah! The answer. "The greatest War Memorial." Names. Signatures. Hundreds of them. In both rooms, all the way around. Mingled with tiny black silhouettes of airplanes on the wing. Big signatures. Little signatures. Sprawling block letters. Delicate script. Familiar names. Famous names. O. L. Locklear, first to change planes in the air. William Mitchell, the "stormy petrel." Mason M. Patrick, Chief of the Air Corps. Frank Lahm and William Gillmore, now generals in the Army Air Service. Lowell Smith, Eric Nelson, and the other Round-the World flyers. R. L. Maughan, Dawn-to-Dusk flyer. Kenneth Unger, British ace. E. M. Deckert, French ace. Eddie Rickenbacker, American ace. Sir Keith Smith, first to fly from England to Australia. Bob Fowler, pupil of the Wright brothers. Oakley Kelly, endurance flyer. Hundreds of them, all pilots. British flyers, French flyers, American flyers. War heroes. Scattered. Disabled. Dead.



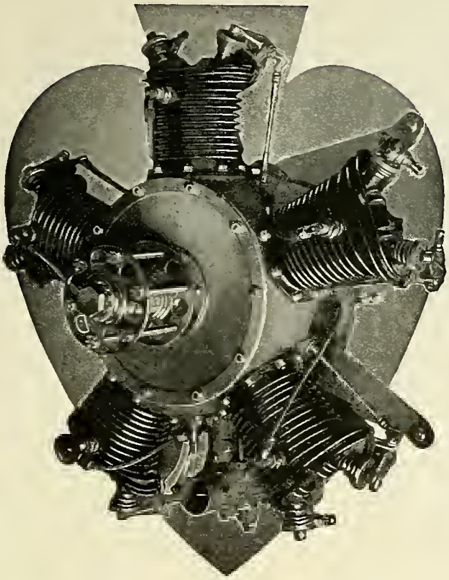
Brig. General W. E. Gillmore holds the ladder while Major General Mason M. Patrick signs his name on "The Hangar" wall.

A War Memorial. No cold, inanimate pile of stone. A little house, full of memories. Steeped in traditions. Sacred to the men who fly. A house with a personality. With a history.

The story? One moment. What is this piece of fabric on the wall? A German cross torn from a plane shot down by Captain Signer. This propeller? From the first airplane to fly across San Francisco Bay, back in 1912. Horace Kearney, pilot. And here is Lincoln Beachey smiling out from the old crate with which he thrilled the Exposition crowds in 1915. Army rifles, machine guns, gas masks, a cadet hat. French war posters, airplane belts, ash trays with bullets for

(*Continued on page 75*)

A MESSAGE TO AEROPLANE MANUFACTURERS



Aeroplanes and dirigibles
powered with engines
produced by

Detroit Aircraft Engine Works (Synd.)

are assured of

Economy in first cost
Economy in maintenance
Economy in gasoline and oil mileage
Economy in performance
Economy in long life

Write for full particulars.

Capt. E. V. Rickenbacker

Detroit Aircraft Engine Works (Synd.)

Lonyo Boulevard & Detroit Terminal Railway
Detroit Michigan

WESTERN NEWS

© International.

Douglas 02 Observation planes ready to be sent to the Mexican Government.

HOLLYWOOD AERO CLUB ORGANIZED

THE newly organized Hollywood Aero Club has opened headquarters at the Hollywood Plaza Hotel. One hundred army and commercial flyers, banded together under Roger J. Adams as temporary president and Harry Fieldhouse as temporary secretary, have outlined definite objectives in their plan. They would make the film capital the center of aviation interest west of the Rocky Mountains, and they are unanimous in their desire for a nation prepared to meet both the demands of progress and the call of war if necessary.

Negotiations have been completed for the immediate use of fields and equipment at San Diego, Oakland, Glendale and Klamath Falls, Ore., and the club is considering plans for the acquiring of a site for a proposed training school.

A committee is now at work arranging an air fête to be held in Hollywood.

Paul W. Wittemann will head the airplane committee; A. Ray Knabenshue is chairman of the dirigible committee; E. Barlow is chairman of the entertainment committee, and R. Barlow and George Rush will serve on the finance committee.

A request has been forwarded to Washington for the *Los Angeles* to visit the Pacific Coast and participate in the air fête with all available aircraft now stationed on the West Coast.

EAGLEROCK DEALERS

DEALERS recently appointed and who will conduct intensive sales campaigns for the Alexander Aircraft Company in their territories are comprised of the following:

The Bennett Eaglerock Sales Company, located at Kansas City, is operated by Dr. George L. Bennett as dealer with headquarters at Richards Field of that city. Dr. Bennett has been recently put in charge of Richards Field and is operating a flying school with Fred J. Kane as chief pilot and instructor. Dr. Bennett writes that cross-country flights and passenger work are both very popular and the prospects for spring sales are good in both eastern Kansas and Western Missouri, which comprise his territory for the Alexander Company.

James S. Charles of Richmond, Virginia, Eaglerock dealer for Virginia and North Carolina, recently took delivery of his demonstration ship and flew from Denver to Richmond in a little less than 20 flying hours. Mr. Charles is a veteran of the game and has many hundred hours to his credit both as an army and commercial pilot. He states that the lean and hungry years are about over and the prospects for profitable business in commercial aviation are very promising.

Wyoming Airways, Inc., of Casper, Wyoming, headed by Walter Storrie, have recently taken an Eaglerock franchise for Wyoming state. They are one of the few commercial companies that have always operated with success. Each year's operations have shown a profit; and now, with the advent of a modern ship which can be economically operated, the Powder River boys are going to cash in big on future operations. The personnel of the organization is: Walter Storrie, president; D. P. Wardwell, secretary and treasurer; Dick Leferink, chief pilot and field manager. Three live wire salesmen and all experienced pilots. Mr. Storrie is head of the Casper Buick Company and has made a success in marketing that automobile in his territory. The same successful policies will be used in merchandising the Eaglerock airplane.

G. Torlotting, of New York City, who is the most recent member of the Alexander Eaglerock selling organization and who has the exclusive franchise in New York and Connecticut, is a well known business man and air enthusiast. He will operate from the Curtiss Flying Field for the present time and plans to establish a field of his own in the vicinity of New York City and several other fields throughout this territory.

Bridgeton Aircraft Company, of St. Louis, Mo., have been successfully operating for several years from their field at Anglum, Mo. They are planning to promote the Eaglerock sales in a big way in their territory during the coming year.

C. E. Steele, Dodge City, Kansas, who has flown an Eaglerock over every part of the United States in the last six months, has finally settled down in Dodge City and started a field and flying school. He has been appointed dealer for western Kansas. Steele's ship, it will be recalled, won first place in the On-to-Denver race at the Mile High Air Meet. He states that since that time he has paid for his ship several times over, barnstorming in the various parts of the country.

Southwestern Aircraft Corporation, of Oklahoma City, who are Eaglerock dealers in Oklahoma and the Texas panhandle, have been very successful in their sales efforts since receiving their demonstration ship. Four new ships were sold within two weeks following the appearance of the plane. Paul R. Braniff, insurance man of Oklahoma City, is general manager of the company, and has converted many of the business men in his territory to the feasibility of airplane travel.

Ryan Field, San Diego, Calif.—terminus of Los Angeles-San Diego airline.

students of today are the pilots of tomorrow

WE offer for all Winter training our new production, safety Eaglerocks at Alexander Airport, high—dry—sunny Denver. Experienced pilots. A low charge of $50 for 5 hours, in advance. Additional instruction and solo practice may be had at $10 per hour. *No bond required for solo flights.* Our students average solo flights in 8 to 10 hours. Watch the ships built at our factory.

Your nearest Eaglerock dealer gives expert flying instruction at a moderate charge. You are not obligated in any way to purchase an Eaglerock but one may be had for—

CASH ON DENVER FIELD
$2475
OR
BUY ON OUR TIME PAYMENT PLAN

Performance With Economy

ALEXANDER AIRCRAFT CO.
ROOM 402
ALEXANDER INDUSTRIES BLDG.
DENVER, COLORADO

EAGLEROCK DEALERS WITH DEMONSTRATORS ON THEIR FIELDS:

Southern California—Aero Corporation of California, Los Angeles
Northern California—W. L. Lamkin, Porterville, California
Michigan—Niles Airways, Niles, Michigan
Indiana—Captain J. A. Yonge, Gary, Indiana
Illinois—Sievert Aircraft Corp., Chicago, Illinois
Okla. & Texas Panhandle—Southwest Airplane Sales Corp., Okla. City, Oklahoma
Virginia and North Carolina—J. S. Charles, Richmond, Virginia
W. Missouri and E. Kansas—Bennett Eaglerock Sales Co., Kansas City, Missouri
E. Missouri and Arkansas—Bridgeton Aircraft Corporation, St. Louis, Missouri
Wyoming and Montana—Wyoming Airways, Casper, Wyoming
Western Kansas—C. E. Steele, Dodge City, Kansas
N. Y. and Conn.—G. Torlotting, Curtiss Field, Long Island, New York
Southern Texas—Dick Hair, Box 420, San Antonio, Texas

NEW AIRCRAFT CO. IN LOS ANGELES

LOS ANGELES has taken another step forward in its destination as one of the outstanding aviation centers of America with the announcement that the International Aircraft Corporation is establishing its factory there and this month will begin active production on several types of planes for commercial use, designed by Edwin M. Fisk, vice president and chief engineer of the corporation.

Fisk entered the aeronautic field in 1910 and since that time designed and built many types of successful planes. His achievements include monoplanes, biplanes and triplanes, some of which were the pioneers of our present day airplanes. In 1914 he designed and constructed for the Japanese government the first stagger-decalage biplane ever built. This plane has been in use continually for twelve years and is still carrying mail in Japan. In 1916 he designed and built the first three-motored triplane to be constructed in America. Subsequently he constructed smaller triplanes and biplanes which were placed in passenger service between Los Angeles and Bakersfield.

One of Fisk's most recent creations is an eight-passenger cabin triplane with two OX5 motors. This plane is shortly to be placed in regular passenger service between Los Angeles and the properties of the Club Internationale of Ensenada, Mexico.

He announces the completion of plans and specifications for a trimotored, 22-passenger air liner which can be converted into a 15-passenger sleeper, construction of which will be undertaken soon. One of the most successful planes created by Fisk is the C-F 12 sport job. One of these ships has been put through a rigid test which proved that the plane can be governed almost entirely by the rudder.

In addition to Fisk, the officers of the company include: Charles H. Urban, president; H. A. Speer, vice-president and director of sales, and Charles J. Warren, secretary-treasurer.

AERO CORP. OF CALIF.

DURING the last two weeks of November The Aero Corporation of California sold four Alexander Eaglerocks and established thereby what is believed to be a sales record for light commercial ships on the coast for that period of time. The purchasers of these ships were T. K. Brown of San Diego, Dr. T. H. Costinbader of Los Angeles, Marion E. McKeen of Ventura, who has taken over the Ventura agency for the Aero Corporation, John Bowers and George Irvin of Hollywood.

The winter rains which bring happiness to the farmers and leave the bootblacks and aviators despondent have started in Southern California and materially cut down the flying hours. However there are still some sunny days and between showers the Aero Corporation instructors are giving their students experience in take-offs and landings on heavy fields. This company reports that last month they enrolled ten new students bringing their total enrollment up to fifty-two students. Four students were soloed and graduated in November and are now proudly wearing the official pilots wings of the Aero Corporation and impatiently waiting for the time when they can own their own planes.

The new students are Floyd Anderson of Hollywood, G. R. Blaisdell, Guy Cale, G. L. Durfuss, John Heddon, C. W. Neir, and M. Bradley Williams of Los Angeles, J. W. Fukua and Elmer Swaney of Beverly Hills, and R. O. Holloway of Culver City. Those soloed are R. Bain Grant, E. Carlson, George Cooke, and E. A. Milz. Mr. Grant came from Vancouver to the Aero Corporation to learn commercial aviation from the ground up with the intention of opening his own airport in Vancouver. He is now negotiating for a fleet of light commercial planes for both land and water flying and will soon leave for the north to carry out his plans.

NIGHT AIRWAY LIGHTS COAST

THE largest lighted airway system in the West has been completed and will guide the mail planes of the Pacific Air Transport from Seattle to Los Angeles.

There are seventeen automatic rotating beacons between Los Angeles and San Francisco, and nine between Seattle and the Golden Gate.

LEARN TO FLY

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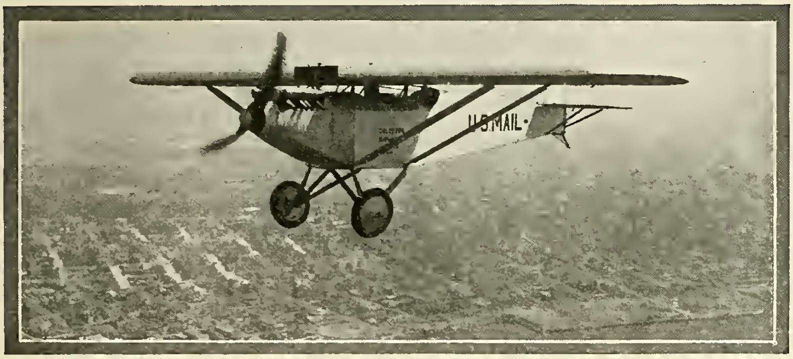
Aircraft Regulations—



—and new equipment

IT costs less in the long run to invest in a MODERN commercial airplane and have it up to standard than to re-build inefficient types in the hope that they will pass government specifications.

The RYAN M-1 clearly indicates a new trend in aeronautical design. The single wing, placed high, minimizes the danger of damage in bad country. The whole plane is constructed with the safety factor of a pursuit, it can be stunted continually and under the gruelling strains of hour after hour service in all kinds of weather, on all types of fields, IT WILL STAND UP.

Dealers Are Preparing for Spring Delivery

RYAN AIRLINES
SAN DIEGO

DUCK HUNTERS TO TAKE FLYING TRIP

A FLOTILLA of airplanes will leave Los Angeles during the first week of January for a two-day trip to the duck farms in Imperial Valley. There will be two Universal Fokkers, the Ryan Cloudster, and one or more of each of the late commercial ships now on the coast, aboard which will be the hunters, their guns and dogs.

The El Centro Chamber of Commerce will welcome the hunters and escort them to the marshes. Guests of honor include Buron Fitts, Lieutenant Governor-elect, Chief of Police James E. Davis Hugh Pomeroy, Gordon Whitnall, Donald Douglas and D. E. McDaneld. Charles H. Babb is in charge.

If they are successful in getting plenty of duck, there will be a duck dinner on their return. The purpose of the expedition, aside from the sporting element is to sell aviation and to boost for a municipal airport.

NEW AIR MAIL RECORD

FIGHTING his way through snow and black clouds at the rate of almost 161 miles per hour, E. Hamilton Lee, senior air mail pilot, broke all records recently when he arrived in Chicago two hours and thirty-nine minutes after he took off at Omaha, a distance of 426 miles. He was flying a Douglas plane, carrying San Francisco, Chicago and New York mail.

Underwood & Underwood.

Air Mail Pilot E. Hamilton Lee.

A HEALTHY OUTLOOK

J. DON ALEXANDER, president of Alexander Aircraft Company, gives an interesting and hopeful bird's eye view of the future of the American aircraft industry in the December *Aircrafter,* his company's house organ. Pointing out the increase from 2½ million to 20 million automobiles and trucks in ten years, and the comparative low cost, the speed and ease of air travel, he is willing to place a side bet that he will come out with two shirts in the aviation business.

DENVER NEWS

THE Air Service Club of Denver held a dance and card party at their club house on November 27. It was well attended and the refreshments furnished by the "Gas Tank" were enjoyed by all.

A party in honor of Lieutenant Arnold of California, who is flying a new Douglas O2 from Clover Field to Denver, is being planned. The plane is part of the new equipment to be furnished the National Guard squadron there.

Lieutenant Earl Packer of the Air Mail has equipped his Ryan M1 with landing lights and has been practicing night flying in preparation for the coming winter flying.

The excellent Colorado weather permits flying every day at Alexander Airport.

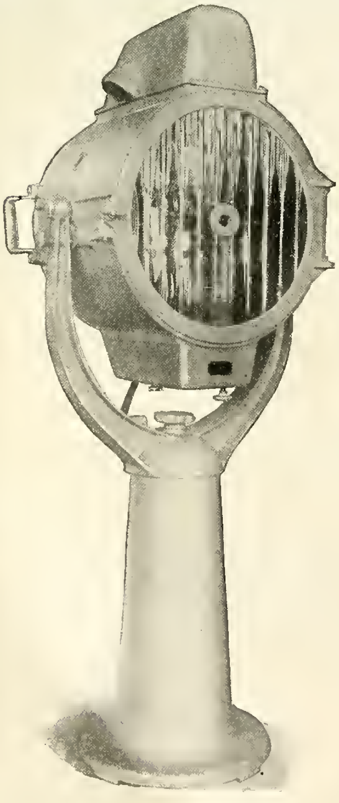
SAD NEWS

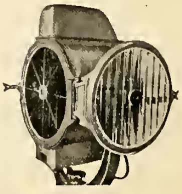
AS we go to press we learn from our Los Angeles representative of the death of Lieutenant Kenneth W. Montee at El Centro, after a short illness of fever contracted while doing a mapping job.

Lieutenant Montee was the winner of the On-to-New York race in the National Aeronautic Races held at New York in 1925.

He is the son of J. W. Montee who recently at the age of 62 made a flight from Los Angeles to Mitchel Field.

Lieutenant Montee's aeronautical activities were many on the West Coast where he was greatly admired and loved by those who came in contact with him.





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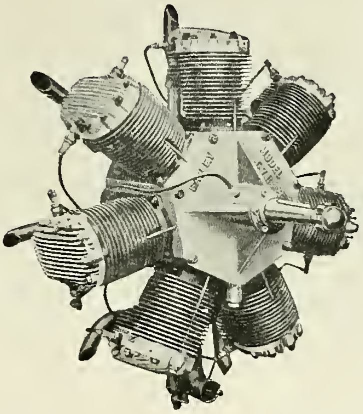

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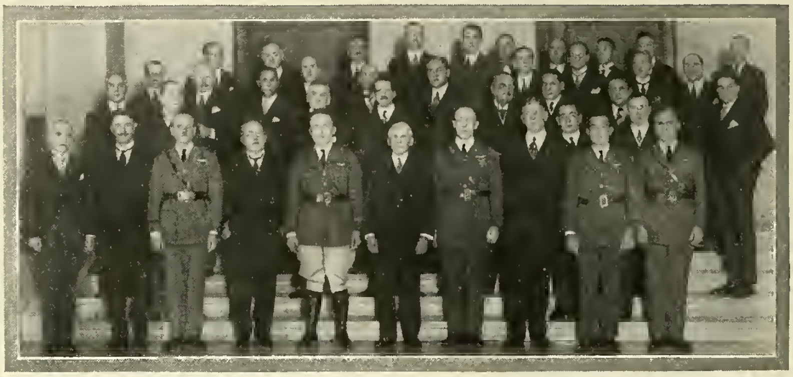
NEWS OF THE AIR SERVICES



© *Henry Miller.*

Pan-American flyers honored at luncheon given by Secretary of State Kellogg.

Left to right, front row—Dr. J. Varela, Minister of Uruguay; Senor Miguet Cruchaga Tocornal, Chilean Ambassador; Lt. Muir F. Fairchild, Dr. Herman Velarde, Peruvian Ambassador; Lt. P. F. Thompson; Secretary of State, Frank Kellogg; Major Herbert A. Dargue, Commander of the Army's Pan-American Flight; Secretary of War, Dwight Davis; Captain Arthur B. McDaniel, and Captain Ira Eaker.

PAN-AMERICAN FLIGHT

TAKING off from Kelly Field, Texas, on the morning of December 21, the five Army amphibian planes began their 18,500 mile flight which will take them around the coast of South America. Their first hop of 260 miles to Laguna del Madre was made in 2 hours 40 minutes at an average speed of 90 miles an hour. This was their first and last stop in the United States before returning to Miami, Fla., next May.

The ships landed at Huasteca Field, Tampico, Mexico, on December 22 at 5:30 p. m. On Christmas eve the airmen are scheduled to visit Mexico City, where they are to convey to President Calles greetings from President Coolidge.

Similar messages are to be delivered to the heads of the twenty South American States and eight colonies to be visited by the flyers.

The start from Kelly Field, scheduled for 9 o'clock, was delayed when it was found that the flagship *New York* had developed tire trouble. It was necessary to remove the two flats and put on two good tires. The *St. Louis*, last to take off, cleared the field at 10:57 a. m.

The *New York*, piloted by Major Dargue and Lieutenant C. E. Whitehead took the air immediately behind Major General Patrick in the "dog ship," who led the way as far as Mitchell Lake.

The *San Antonio*, piloted by Captain A. B. McDaniel, second in command of the flight, and Lieutenant C. McK. Robinson, did not rise so gracefully. She veered off the runway as she was about to ascend, rose, and then dipped, the landing wheels skipping along on top of the muddy ground.

The other planes took off in the following order: The *San Francisco*, piloted by Captain I. C. Eaker and Lieutenant M. D. Fairchild; the *Detroit*, Captain C. F. Woolsey and Lieutenant J. W. Benton, and the *St. Louis*, Lieutenant B. S. Thompson and Lieutenant L. D. Weddington.

The escorts from Brooks and Kelly Fields were already in the air. The Pan-American ships went into "V" formation with Kelly Field flyers on the right and planes from Brooks Field on the left. Three more planes from Kelly Field, which formed an escort to Laguna del Madre, were in the rear.

The planes circled the field, turned toward San Antonio, flew over the business section of the city, and then pointed their noses towards the Mexican border. Soon they disappeared from sight. The Brooks and Kelly fields escorts, except for the three going to Laguna del Madre, turned back after passing Brooks Field.

Pilots of the ships forming the escort to Laguna del Madre were Lieutenants John I. Moore, Thomas W. Blackburn and Graham St. John.

Formation ships for the departure were flown by the following: Lieutenants Emil Kill, E. F. Booth and E. E. Partridge, Kelly Field, and Lieutenant W. H. Brookley, Staff Sergeants R. M. Dewald and W. S. Rosenberger, Brooks Field. Camera planes were taken up by Lieutenants J. W. Monahan, and Levibery.

MARINE CORPS CROSS-COUNTRY FLIGHT

A THREE-WAY transcontinental flight by Marine Corps flyers for the purpose of training pilots and "ferrying" six Boeing fighting planes (FB 3s) from the east to the west coast is in progress. The first and second legs of the flight, San Diego, Calif., to Quantico, Va., and return, have been successfully completed. Six of the pilots will return from San Diego to Quantico and will terminate the cross-country flight.

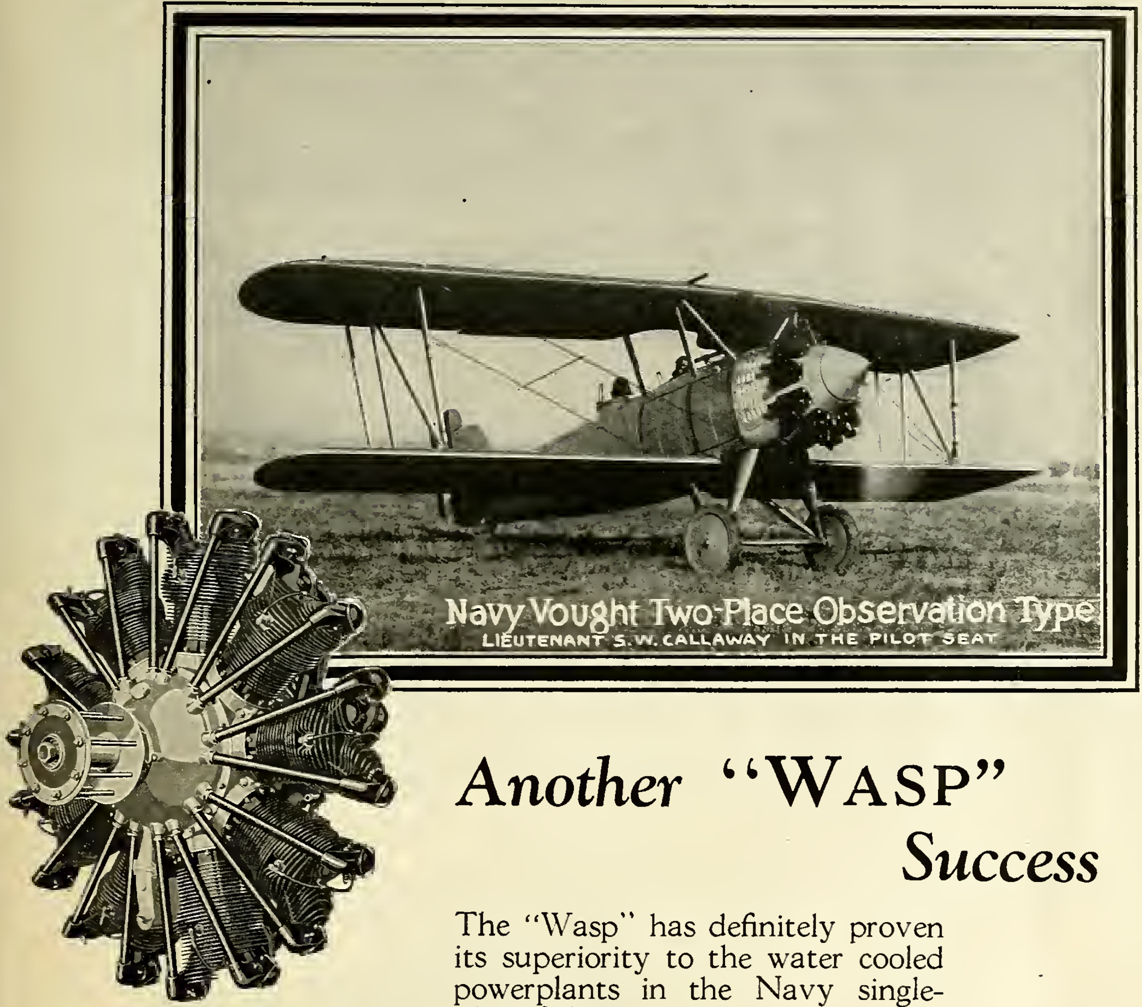
After delivering the planes on the west coast, the three observation planes, one Douglas and two DHs, from Quantico will return to their east coast base bringing back three of the pilots who flew the fighting planes across the continent.

The flight is under the command of Major R. E. Rowell, U. S. M. C. The southern route was followed from Quantico to San Diego, stopping at Fayetteville, N. C.; Augusta, Ga.; Montgomery, Ala.; Talulla, La.; Dallas, Tex.; San Antonio, Tex.; El Paso, Tex.; and Tucson, Ariz.

Major Rowell pilots one of the fighting planes. The other pilots of these planes are Lieuts. W. J. Wallace, C. C. Jerome, of San Diego, and Lieuts. W. L. McKitterick, Capt. J. T. Moore and Lieut. C. F. Schilt, of Quantico.

Wide World Photo.

New Boeing fighting planes of the Marine Corps, on the transcontinental flight, commanded by Major R. E. Rowell.



Navy Vought Two-Place Observation Type
LIEUTENANT S. W. CALLAWAY IN THE PILOT SEAT

THE "WASP"
425 HP at 1900 RPM
WEIGHT 650 lbs.

Another "WASP" *Success*

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Flight tests of this new two-place observation type equipped with the "Wasp" indicate the same superiority. This new ship is indeed a worthy successor to the long line of successful Vought types.

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ARMY AND NAVY AIR SERVICE ORDERS

ARMY AIR CORPS ORDERS

THE following Army Air Corps orders have been issued as of the dates indicated in brackets:

Alexander, 1st Lt. Irvin, relieved from detail in Air Corps and will report to Infantry at Fort Sam Houston, Tex. (Dec. 9)

Archer, 2d Lt. Cecial Elmore, promoted to 1st Lt., Oct. 29, 1926. (Nov. 26)

Billingsley, Warrant Off. Harrison, Panama Canal Dept., assigned to duty with Air Corps, Brooks Field Tex., effective upon completion of foreign service. (Dec. 14)

Brown, 1st Lt. Raymond R., leave of absence, 10 days. (Dec. 6)

Burget, 1st Lt. Walter K., appointed survey officer for all materials to be surveyed within the Santa Monica, Calif., district of the procurement section in addition to his other duties. (Dec. 8)

Cronau, 1st Lt. Robert T., from Kelly Field, Tex., to Canal Zone. (Dec. 17)

Early, 2d Lt. James F.. J., upon return to Aberdeen Proving Grounds, Md., will stand relieved, and will proceed to Brooks Field, Tex. Report to Scott Field, Ill., to temporary duty before assuming new post. (Dec. 8)

Greenlaw, 1st Lt. Harvey K., relieved from assignment and duty at Air Corps Technical School, Chanute Field, Rantoul, Ill., and will proceed to San Antonio, Tex., and report to commanding general Air Corps training center for duty. (Dec. 2)

Hager 1st Lt. John Manfred (Reserve), to office Assistant Secretary of War for training in connection with procurement activities. (Dec. 17)

Healey, 1st Lt. James A., relieved from further duty at Scott Field, Ill., and directed to Kelly Field, Tex. (Dec. 7)

Hine, 1st Lt. Virgil, from Brooks Field, Tex., to Bowman Field, Louisville, Ky. (Dec. 11)

Hopkins, Capt. Hubert V., assigned to duty at McCook Field, Dayton, Ohio, on completion of his foreign tour. (Dec. 16)

Jamison, 2d Lt. Glen C., from duty at Brooks Field, Tex., to Canal Zone. (Dec. 17)

McCormick, 1st Lt. Harlan T., leave of absence, 1 month. (Dec. 8)

McDonnell, Maj. John C., from Wright Field, Ohio, to temporary duty at Philadelphia, Pa., and thence to Third Corps Area headquarters, Baltimore, Md. (Dec. 9)

Meredith, 1st Lt. Russell Luff, promoted to Capt., Sept. 10, 1926. (Nov. 26)

Merrick, 2d Lt. Louis Meline, promoted to 1st Lt., Nov. 9, 1926. (Dec. 6)

Mills, 1st Lt. Samuel P., leave of absence, 2 months, 10 days. (Dec. 7)

Moore, 1st Lt. John I., leave of absence, 2 months. (Nov. 27)

Phillips, 2d Lt. Donald Boyer, to 1st Lt., Oct. 16, 1926. (Nov. 26)

Pratt, Maj. Henry S., appointed to meet in Washington, D. C., for the purpose of submitting recommendations on proposed Executive Order governing flying pay. (Dec. 4)

Reynolds, Capt. Clearton H., leave of absence, 3 days. (Dec. 16)

Robinson, 1st Lt. Irvin A., Inf., relieved from detail in Air Corps and will report to Infantry at Fort Sam Houston, Tex. (Dec. 9)

Schultz, 1st Lt. Laclair D., appointed to meet in Washington, D. C., for the purpose of submitting recommendations on proposed Executive Order governing flying pay. (Dec. 4)

Searby, 1st Lt. Edmund W., Field Art., Fort Sam Houston, Tex., to Fort Sill, Okla. (Dec. 7)

Seiler, 1st Sgt. Daniel G., Scott Field, Ill., retired. (Dec. 7)

Staton, Capt. Adolphus, appointed to meet in Washington, D. C., for the purpose of submitting recommendations on proposed Executive Order governing flying pay. (Dec. 4)

Taylor, 2d Lt. John Osman, transferred to Field Art. (Dec. 8)

Terry, Capt. Carl C. (Ordnance Dept.), relieved from detail in Air Corps with station at Fort Sam Houston, Tex., and will report to commanding officer same station for duty as assistant to the ordnance officer. (Dec. 14)

White, 2d Lt. Walter Cornelius, Inf., transferred to Air Corps. (Dec. 16)

Young, Capt. Harry H., leave of absence, extended 5 days. (Dec. 1)

NAVY AIR SERVICE ORDERS

THE following Navy Air Service orders have been isued as of the dates indicated in brackets.

Billings, Lt. Arthur S., detached V.O. Squadron 1, *U.S.S. Pennsylvania*, Aircraft Squadrons, Battle Fleet to *U.S.S. Langley*. (Nov. 22)

Brown, Lt. (j.g.) Charles R., detached V.T. Squadron 1, Scouting Fleet, to Bureau of Aeronautics. (Nov. 26)

Crinkley, Lt. Andrew, detached *U.S.S. Langley*, to VS Squadron 2, Battle Fleet. (Nov. 19)

Dean, Lt. William J. (S.C.), detached Naval Aircraft Factory, Navy Yard, Philadelphia, Pa., to continue treatment, Naval Hospital, League Island, Philadelphia, Pa. (Dec. 6)

Duckworth, Lt. (j.g.) Herbert S., detached V. T. Squadron 1, Aircraft Squadrons, Scouting Fleet, to Naval Air Station, Pensacola, Fla. (Dec. 6)

Durgin, Lt. Calvin T., duty to aviation detachment of V. O. Squadron 2, *U.S.S. New Mexico*. (Nov. 20)

Fake, Lt. Frank C., to duty *U.S.S. Langley*. (Nov. 19)

Harper, Lt. Cecil F., orders June 26, 2926, modified to aviation detachment, V. O. Squadron 1, *U.S.S. Pennsylvania*. (Nov. 22)

Harris, Lt. (j.g.) Edward M. (M.C.), detached *U.S.S. Florida*, to Naval Air Station, Anacostia, D. C. (Dec. 8)

Henderson, Lt. George R., orders November 12, 1926, to V. O. Squadron 3, Aircraft Squadron, Scouting Fleet, revoked; to continue duty Naval Air Station, Anacostia, D. C. (Nov. 27)

Johnston, Lt. (j.g.) Bates H., orders November 13, 1926, to Naval Air Station, Pensacola, Fla., revoked; to V. S. Squadron 1, Aircraft Squadrons, Scouting Fleet. (Dec. 4)

Kirkpatrick, Lt. Comdr. Robert D., detached Bureau of Aeronautics, to Assistant Naval Attaché, London, England. (Dec. 11)

Leach, Ensign Walter D., detached Naval Air Station, Pensacola, Fla., to *U.S.S. Lamson*. (Dec. 3)

Lenhart, Lt. (j.g.) John J., detached Aircraft Squadrons, Scouting Fleet, to V. O. Squadron 6, Aircraft Squadrons, Scouting Fleet. (Nov. 26)

Lind, Lt. Comdr. Wallace L., detached *U.S.S. Arizona*, to Naval Hospital, Mare Island, Calif., for treatment. Orders October 12, 1926 to Naval Air Station, revoked. (Nov. 19)

Lynch, Lt. William A., detached Naval Air Station, Pensacola, Fla., to *U.S.S. V-2*. (Nov. 20)

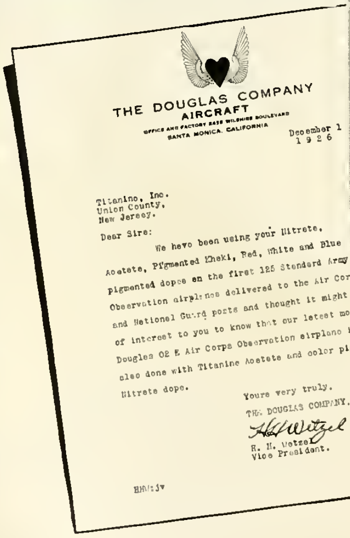
Pawlikowski, Lt. (j.g.) Leo P., despatch orders June 15, 1926, modified; to duty V. J. Squadron 1, Aircraft Squadrons, Battle Fleet. (Nov. 22)

Paunack, Lt. Comdr. Robert R., appointed to meet in Washington, D. C., for the purpose of submitting recommendations on proposed Executive Order governing flying pay. (Dec. 4)

Sall, Ensign Herman, detached Naval Air Station, Pensacola, Fla., to temporary duty *U.S.S. Chewink*. (Nov. 26)

Shine, Lt. Comdr. Thomas, detached Naval Air

(*Continued on page 34*)



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In 1924—Douglas Airplanes Delivered the Nation's Message Round the World.

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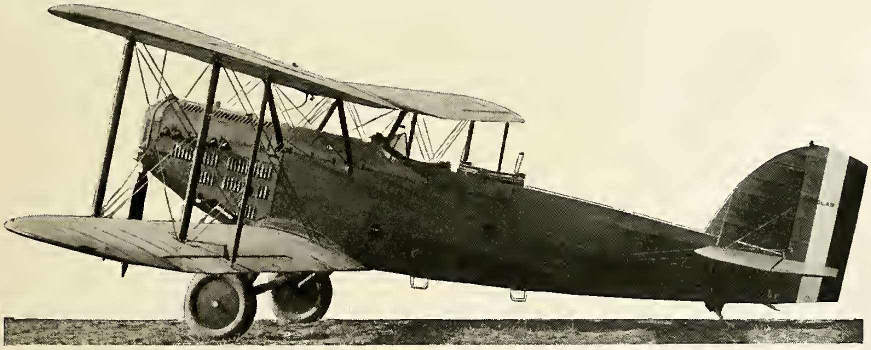


The Improved Air Corps Douglas Observation for 1927

THE DOUGLAS COMPANY

Santa Monica
California

(*Continued from page 32*)

Station, Pensacola, Fla., to *U.S.S. Wyoming.* (Nov. 30)

Snow, Lt. Comdr. Harold E., detached Naval Air Station, Pensacola, Fla., to *U.S.S. New York.* (Nov. 24)

Towers, Comdr. John H., to duty *U.S.S. Langley.* (Dec. 9)

Tucker, Lt. (j.g.) Thayer T., despatch orders June 15, 1926, modified; to V. J. 2 Div. Aircraft Squadrons, Scouting Fleet. (Nov. 26)

Welker, Lt. (j.g.) George W., Jr., detached *U.S.S. Milwaukee,* to temporary duty Naval Air Station, Pensacola, Fla. Orders Nov. 5, 1926, to *U.S.S. Chewink* revoked. (Nov. 20)

Wilson, Comdr. Eugene E., detached Naval Air Station, Pensacola, Fla., to Bureau of Aeronautics. (Dec. 6)

Yarquell, Lt. (j.g.) Charles C. (M.C.), detached Naval Air Station, Anacostia, D. C., to temporary duty Naval Medical School, Washington, D. C. (Dec. 11)

Yeandle, Lt. Comdr. Stephen S., appointed to meet in Washington, D. C., for the purpose of submitting recommendations on proposed Executive Order governing flying pay. (Dec. 4)

MARINE CORPS AIR ORDERS

THE following Marine Corps orders have been issued as of the dates indicated in brackets:

Britt, 2d Lt. G. M., detached M. B., Naval Air Station, Pensacola, Fla., and assigned to duty at Naval Air Station, Pensacola, Fla., for aviation instruction. (Dec. 4)

Burger, 2d Lt. J. C., detached M. B., Naval Air Station, Lakehurst, N. J., to M. B., Quantico, Va. (Nov. 27)

Byrd, Capt. W. C., detached M. B., Quantico, Va., to Naval Air Station, Pensacola, Fla. (Dec. 4)

Conway, 2d Lt. W. W., detached M. B., Naval Air Station, Pensacola, Fla., and assigned to duty at Naval Air Station, Pensacola, Fla., for aviation instruction. (Dec. 4)

Dewine, 2d Lt. L. R., detached M. B., Naval Air Station, Pensacola, Fla., and assigned to duty at Naval Air Station, Pensacola, Fla., for aviation instruction. (Dec. 4)

Fike, 2d Lt. C. L., detached M.B., Naval Air Station, Pensacola, Fla., and assigned to duty at Naval Air Station, Pensacola, Fla., for aviation instruction. (Dec. 4)

Green, 2d Lt. T. C., detached Naval Air School, Cavite, P. I., to M. D., *U.S.S. Asheville.*

Griffin, 2d Lt. R. L. Jr., detached M. B., Parris Island, S. C., to M. B., Naval Air Station, Pensacola, Fla. (Dec. 8)

Howard, Capt. E. D., detached M. B., Quantico, Va., to Naval Air Station, Pensacola. (Dec. 4)

Humphrey, 1st Lt. J. D., detached M. B., Parris Island, S. C., to Naval Air Station, Pensacola, Fla., to report not later than January 4. (Dec. 10)

Narum, 2d Lt. L. F., detached M. B., Quantico, Va., to Naval Air Station, Pensacola, Fla. (Dec. 4)

Snedeker, 2d Lt. J., detached M. B., Quantico, Va., to Naval Air Station, Pensacola, Fla. (Dec. 4)

Walker, 2d Lt. T. J., Jr., detached M. B., Quantico, Va., to Naval Air Station, Pensacola, Fla. (Dec. 4)

Zuher, 2d Lt. detached M. B., Quantico, Va., to M. B., Naval Air Station, Lakehurst, N. J. (Nov. 27)

BARRAGE BALLOONS

THREE high-altitude balloons of 6,000 cubic feet capacity, the first of the kind to be built in this country, have been manufactured by The Goodyear Tire & Rubber Company and shipped to Fortress Monroe, Va., for experimentation by the Army Air Corps.

The new type gas bags, called "barrage balloons" by the air corps, are intended for use in working out the problem of defending cities from aerial attacks in case of a national emergency. Attached to the ground with slender steel cables, the barrage balloons will be sent aloft in such numbers as to completely surround a city making it hazardous for an attacking force of airplanes. Out of sight of the ground, it is believed that the balloon flying at altitudes of more than 15,000 feet may have possibilities in defending highly populated centers from bombing raids. The mooring cables would create aerial nets not unlike those employed under water to repel submarine operations during the World War. The barrage balloons would need no pilots or operators and would be inflated with inflammable hydrogen.

LT. HEALY TO RETURN TO SCOTT FIELD

LIEUTENANT JAMES A. HEALY of Scott Field, Ill., one of the two war time American "aces" still in the United States Air Corps will shortly return to the middle-western lighter-than-air station after assisting in the making the film "Wings", a story of the aviation corps and the World War, at Kelly Field, Texas.

Lieutenant Healy, who was operations officer for the successful American ballooning team in the International Race for the James Gordon Bennett trophy from Antwerp, Belgium, May 30, was detailed to Kelly Field in an advisory capacity a few weeks after arriving in the United States from Europe.

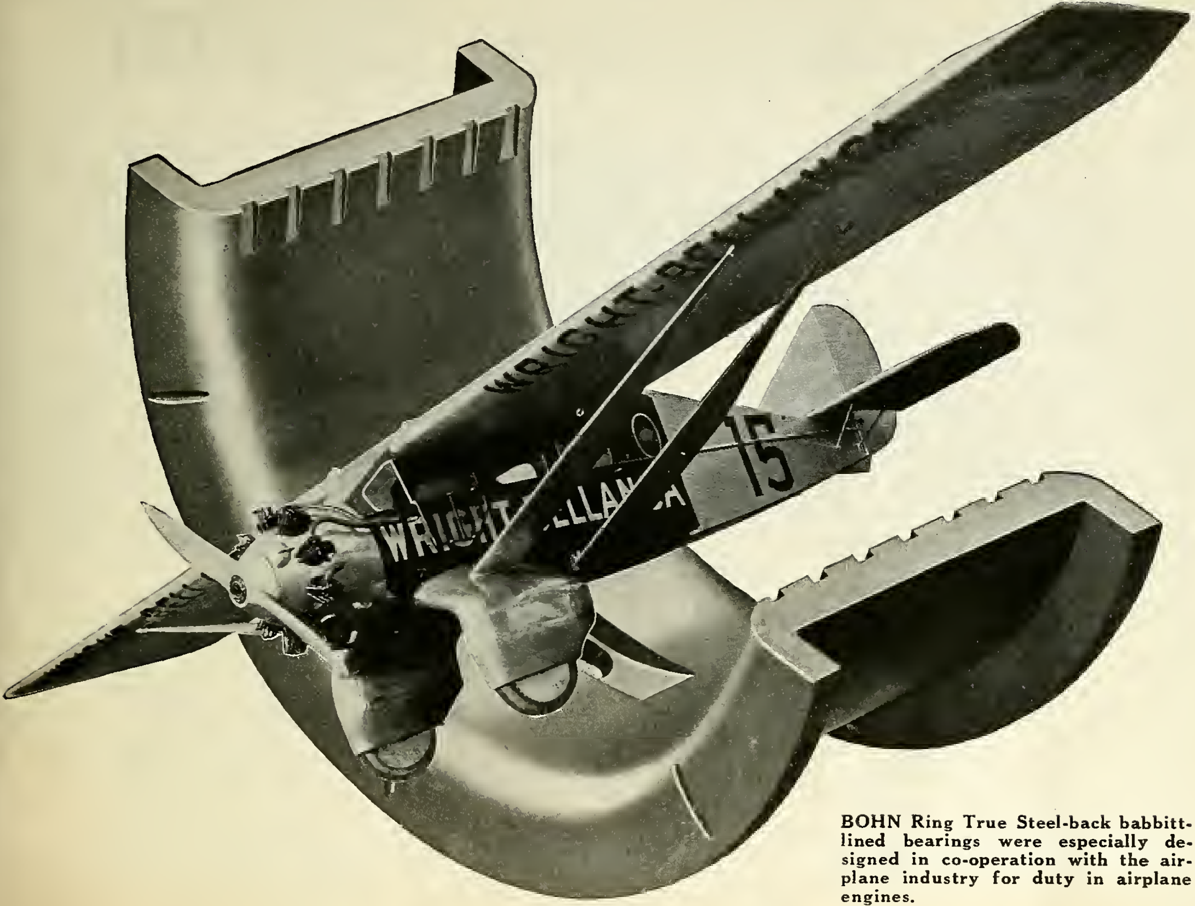
As Lieutenant Healy, with Captain Frank O. D. Hunter, are the only two officers now in the air corps who were "aces" during the war, the assistance of the former in filming the aviation picture has been valuable to the directors and technical staff.

During the war Lieutenant Healy was decorated with the Distinguished Service Cross with two oak leaves, the Croix de Guerre with three palms, the Cross of the Knight of the Legion of Honor, and the Military Cross of Great Britain. He was officially credited with the destruction of seven enemy planes.

As a result of his capable handling of the 1926 National Balloon Race from Little Rock, Ark., he will be invited to take charge of the 1927 race to be started from Akron, Ohio, members of the local committee there have indicated.

© Airmap Corp. of America.

An air view of the Los Angeles passing Sandy Hook during a flight made to study her water recovery apparatus.



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THE AERONAUTICAL INDUSTRY

ATLANTA IS AIRMINDED

By Walter B. Ratliff

DEVELOPMENT of aviation in the Southeast has fixed Atlanta as its hub.

Three things are directly responsible for the situation: first, Candler Field, one of the best landing fields in the entire South; second, operation of the Atlanta-Miami air mail route of the Florida Airways Corporation and, third, government assurance, that the Atlanta-New York air mail line will be placed in operation early in the spring.

The three factors are named in the order in which they contributed to the development. Candler Field, located a short distance south of Atlanta and in quick communication by hard surfaced roads with the famous "Five Points" and Peachtree street of the business district, is the basis of the whole development. But here the personality of a man injects itself in the form of William B. Hartsfield, alderman of the city and chairman of its aviation committee and chairman of the chamber of commerce aviation committee.

Some two years ago Atlanta's aviation activity consisted of an occasional visit by a hardy "cowpasture pioneer" in a decrepit "Jenny". Flying was considered in Atlanta as the occupation of a few daredevils and those who believed in the future of commercial aviation could be counted upon the fingers of one's hands.

About this time the wealthy Candler family, famed owners of Coca Cola, with characteristic foresight offered to the city a 300-acre tract of land on a five-year lease with an option to purchase at about half its actual value, for use as an aviation field. To Mr. Hartsfield, one of the younger members of the city government, fell the tremendous task of developing it and making Atlanta air-minded.

Due to the rolling nature of the country around Atlanta a landing field had literally to be carved and blown into shape. At a cost of nearly $50,000, thousands of yards of earth and granite were removed from the field and two young mountains of solid rock were wiped out. All of this was done in the face of a fight for funds, civic lethargy, ridicule and opposition. At the same time a ceaseless campaign of education and publicity was launched with the result that Atlanta today has one of the best landing fields in the country. It is equipped with standard marker, filling station, rest house, repair shop, lockers for pilots, running water, sewers, electricity, telephones and two large private hangars now are under construction.

How complete has been the transformation of the public attitude is witnessed by the fact that the Florida Airways Corporation is one of the few companies operating successfully with pay loads. Fifteen thousand enthusiastic air-minded Atlantans witnessed the arrival of the first air mail plane early in September. Nearly thirty thousand journeyed out to Candler Field to view the Byrd polar plane during its stay in Atlanta in November and a hundred prominent business men, bankers and civic leaders tendered a banquet to the pilot, Floyd Bennett. The leading banks and business houses are now intensely interested in aviation and are its staunch supporters. One bank devotes its daily newspaper advertisements to espousing the value of air mail.

Opening of the mail line to Miami gave impetus to air navigation in the South which it had never known before. All Atlanta, all Georgia and all Florida immediately began thinking in terms of air mail and air travel. In the recent Florida hurricane every large news service and every metropolitan newspaper in the South turned to airplanes for transportation into the stricken area.

That route laid the foundation for the Atlanta-New York air route announced a short time ago by W. Irving Glover, second assistant postmaster general in charge of transportation. Other routes suggested by Mr. Glover as in prospect for the South are from Atlanta to Birmingham, and New Orleans; from Atlanta to Dallas and Fort Worth connecting with the Chicago and Fort Worth line already in operation, and from Atlanta to Louisville connecting with that line to Chicago.

The Florida Airways already is making plans for the extension of its lines to Havana, Cuba, which together with the New York-Atlanta line will mean transportation for business men from New York to Palm Beach, Miami and Havana for week-end vacations. And unless there is great error in the figures and statistics already compiled by the Department of Commerce, this will be one of the most important and profitable lines in the entire country.

Largely through the efforts of Mr. Hartsfield various cities in the Southeast have become interested in establishing landing fields and the smaller cities in painting their names on roofs of buildings. The city government and the chamber of commerce and civic organizations are squarely behind the movement to make Atlanta the aerial "hub of the South".

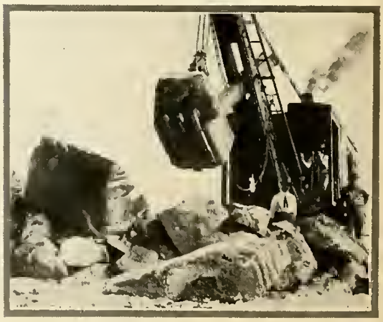
GOOD NEWS!

A FLAT air mail postage rate of ten cents a half ounce effective February 1, 1927, was announced by Postmaster General New following receipt of information from Second Assistant Postmaster General W. Irving Glover from Portland, Oregon, that a number of western air mail contractors had been convinced of the utility of the proposed rate change.

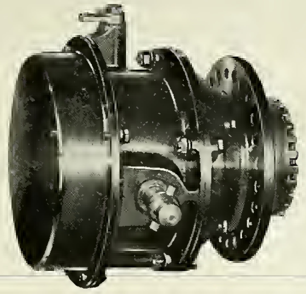
The Post Office Department stated that such a rate was under consideration. Opposition to its establishment was voiced by western air mail contractors and Mr. Glover went west to place the Department's attitude before them personally. Postmaster General immediately fixed February 1 as the date when air mail may be dispatched over any and all lines in this country, regardless of distance, for ten cents per half ounce.

V. E. Chenea and Pilot Flo of Florida Airways (left) welcomed at Candler Field by Mayor Buchanan and W. B. Hartsfield.

William B. Hartsfield.



Removing granite boulders from the 300-acres which is now Candler Field, one of the best airports in the South.



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DORNIER "SUPERWAL"

THE new Dornier flying boat "Superwal" is an enlarged copy of its successful predecessor "Wal", famous for the Spain to South America flight. It is an all-metal monoplane of typical Dornier construction. Its wing is of constant section throughout, braced on either side by a pair of streamlined struts. The vertical and horizontal tail surfaces are also monoplane, the horizontal tail being placed as high as possible to protect it from the water spray. Its plane form is very similar to the wing; it also is braced by two pairs of streamlined struts. The ailerons are very narrow and extend about two-thirds of the span. Ailerons and elevators are balanced by auxiliary surfaces.

The boat is of the single step type, but aft of the step it has a triangular keel portion to prevent it from porpoising and to ease off the landing. Lateral stability on the water is obtained by means of two protecting wing floats. The highly stressed parts of the structure are made of steel, the rest being made entirely of duralumin. The wing is made of two panels joined in the middle and subdivided into three parts—leading edge portion covered with smooth tin, central portion between the beams covered with corrugated tin and an especially light duralumin trailing edge portion which is covered with fabric.

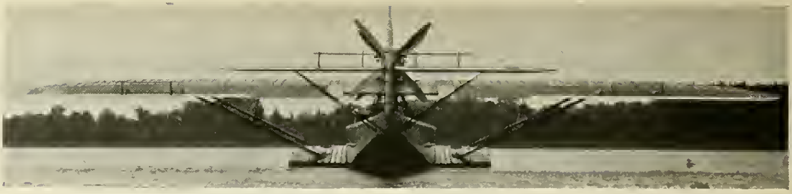
Beams are of built up steel construction and the ribs are of box type, widely spaced. The boat is divided into many watertight compartments with manholes in bulkheads for inspection.

The power plant consists of two 650 h.p. Rolls-Royce "Condor" engines arranged in tandem on top of the wing.

Fuel is stored in a special compartment in the boat, placed near the center of gravity so that the balance of the craft is not affected in flight due to usage of fuel. There are four large tanks of 132 gallons capacity each and four small ones at 62½ gallons capacity each, the total capacity being 778 gallons. Gas is pumped by a wind-operated sprocket type pump into a gravity tank from which it feeds the engines by gravity.

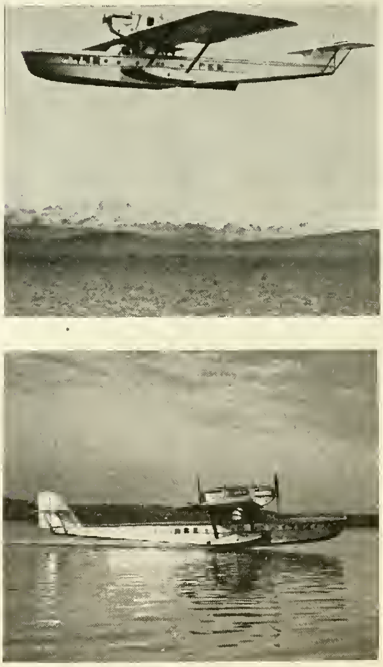
The engines are installed so that it is possible to inspect them and make minor repairs while in the air. Radiators are located below the power plants.

Passenger accommodations consist of two roomy cabins—one in the front for 13 persons, and a second one in the rear for 8 passengers. Behind the front cabin there is a radio room, a lavatory and a small passage leading to the pilots' cabin, in the back of and below which is the fuel compartment adjoining the luggage space and the second passengers' cabin.


Rear view of the Dornier "Superwal," at rest on Lake Constance.

From the standpoint of installation this arrangement is advantageous because lines leading to the instrument board are short and the assistant pilot is near to the power plant. It is possible, however, to alter this arrangement, moving the pilot's cabin toward the bow with the consequent increase in the pilot's visibility.

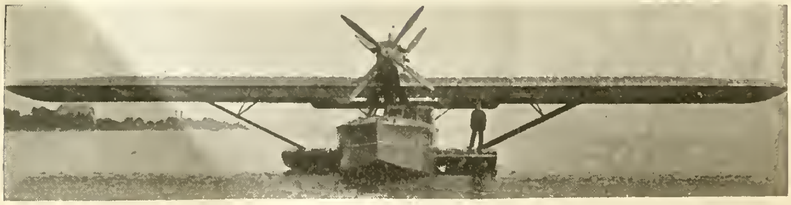
To haul the boat out of the water there are special floating wheels which can be attached by one or two men of the crew by simply inserting their axles into a bushing in each float stub.


The Dornier in flight and alighting.

Specifications

Length over all	80.8 feet
Height over all	17.1 feet
Wing span	93.5 feet
Wing chord	17.4 feet
Wing area	1,540 square feet
High speed	about 120 miles per hour
Range, normal	1,240 miles

During the test flights the "Superwal" took off with a load of almost 13,200 pounds which is greater than its own weight empty, thus permitting, with a limited pay load, a range of over 2 480 miles.


Front view of the Dornier "Superwal" 1300 h.p. commercial flying boat.

BUFFALO AIRPORT

By Notso

"Snow, snow, beautiful—blah!" says Lieut. E. M. Ronne, manager of this airport, as he views the result of our latest blizzard which has changed our cinder runways into a field of white. However, you can't stop a good man and several of the same are flying here right along. (In the December issue of Aero Digest Lieut. E. M. Moore was mentioned as manager of Buffalo Airport, whereas the airport is managed by the above mentioned Lieut. Ronne.)

The other night Ted Mosely and Jim Wylam, in the latter's Waco "Miss Lockport" were testing landing flares for the Eberhart Aeroplane and Motor Co., of this city. The tests were very satisfactory.

Eight Buffalo built Curtiss Hawks were flown away from this airport during the past month by Marine Corps pilots. Major Brainard, chief of the Marine Corps Aviation Section, was one of the ferry pilots, taking the specially decorated Hawk which has been assigned to him. It is a thing of beauty as well as service.

The Italian Schneider cup team, with the exception of Capt. Bernardi, visited this airport recently. They spoke very highly of it.

FIRST FLIGHT ANNIVERSARY BROADCAST

A MEETING of flyers was held under auspices of the American Society for Promotion of Aviation at the Roosevelt Hotel, New York, on the night of December 17th, in commemoration of the first flight of the Wright brothers.

The speakers were: Harry Guggenheim, Edgar C. Garrabrandt, Col. Harold E. Hartney, Capt. Jacques Swaab, Capt. Arthur Raymond Brooks, Lieut. Kenneth Unger, Lieut. Leigh Wade, Capt. Glenn L. Pike, Capt. P. H. Stevens, Lieut. Robert S. Bowen, Lieut. R. Noble Estey, Lieut. Robert Carter, William J. Cogan, Lieut. Cy Caldwell and Frank Tichenor of Aero Digest.

Thomas L. Hill, president of The American Society for Promotion of Aviation, presided. The speeches were broadcast over Station WRNY, and hundreds of complimentary telegrams and letters have been received testifying to the public's general interest in air programs.

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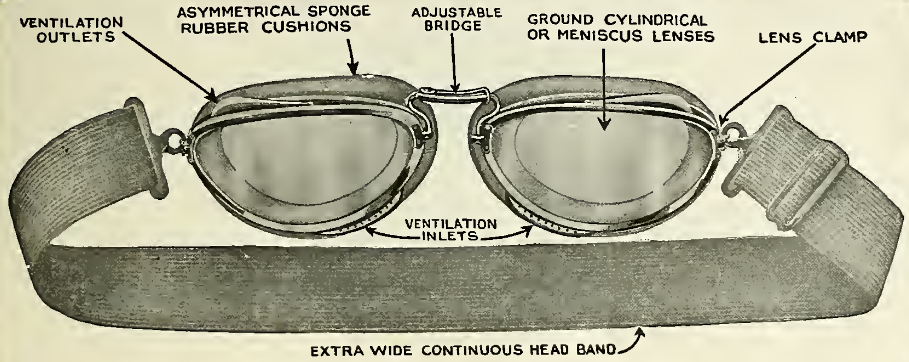
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DH TYPE 66 HERCULES

THE first three-engined plane produced by the British firm of De Havilland was recently test flown and shown to have fully met or equalled the performances predicted for it. Five planes of this type are under construction. They are to be used on the newly established air route to be operated by Imperial Airways, Ltd., between Cairo, Egypt, and Karachi in northern India, 2,500 miles apart. In order to ensure the reliability of travel over this difficult route the design has favored dependable performance rather than maximum carrying capacity.

In the cabin, seats are provided for seven passengers, but arrangement is made for increasing the accommodations to fourteen seats. The new service planned for these machines will result in saving about a week's travel. The first regular trip is scheduled between Egypt and India for the middle of this month.

Steel tube and swaged wire rod construction is employed in the fuselage structure. It is expected that replacements and repairs can be made without requiring the use of shop equipment. The cabin space is 16 feet long. A movable partition is provided to permit variation of the proportions of passenger and cargo space to suit the load carried. Ventilation is carefully considered—means are provided for delivering a supply of fresh air without a draft. Radio apparatus and self-starters are part of the equipment. The starter may be used to generate current for the radio.

The three engines are standard Bristol Jupiters, rated at 450 h.p. each. They are mounted on sheet duralumin plates braced with steel tubes and tie rods. Each engine has its independent fuel and oil supply. For the central engine, instruments are mounted in the pilot's cockpit; instruments for the outboard engines are mounted alongside of the engines.

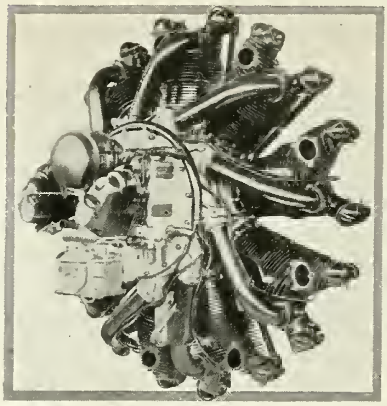
Wings are of conventional construction. Duralumin tube is used for the leading and trailing edges. Struts are of steel tube. In the central wing panel two main fuel tanks are built in. They have a total capacity of 300 gallons. Ailerons, fitted on the lower wings only, are differentially operated.

The tail unit is adjustable during flight to provide the most suitable angle to conform to variable loads.

Level flight can be maintained with about 375 h.p. which means there is ample reserve for emergencies and for taking off safely with full load.

Brief specifications of the De Havilland Hercules (type 66) commercial air liner:

Wing span	79 feet 6 inches
Overall length	66 feet 0 inches
Height	18 feet 0 inches
Total wing area	1,536 square feet
Weight empty	9,500 pounds
Pay load (excluding crew)	3,284 pounds
Weight loaded	14,700 pounds
Wing loading	9.6 pounds per sq. ft.
Power loading	10.9 pounds per h.p.
Fuel capacity	300 gallons
Normal high speed	130 miles an hour
Stalling speed	53 miles an hour
Cruising speed	110 miles an hour
Climb, first minute	765 feet
Time of climb to 10,000 feet	21 minutes
Operating range	525 miles



Pratt & Whitney "Wasp" engine with built-in General Electric supercharger.

NEW GE SUPERCHARGER

THE centrifugal type of supercharger which was originally developed for use in connection with airplane engines for high-altitude flying, was embodied in a modified form intended for relatively low-altitude flight in the new Pratt & Whitney air-cooled radial aviation engine.

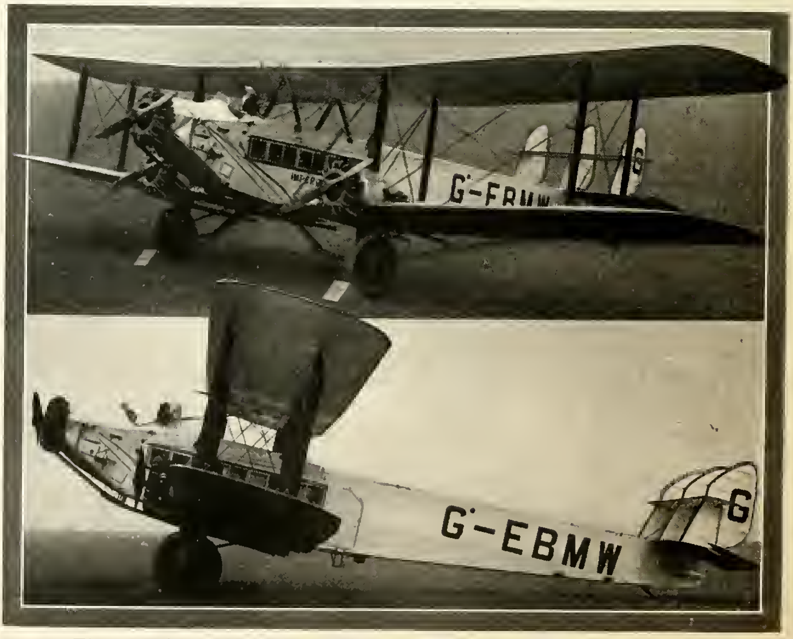
The supercharger, or rotary induction system, as it is now commonly known, is located between the carburetor and the intake manifold. In its latest form, it is built directly into the engine crankcase and does not materially affect either the size or the weight of the engine. Its function is to draw gasoline and air through the carburetor and compress it sufficiently to overcome the normal pressure drop through the carburetor. This means that the mixture is delivered to the engine intake manifold at or slightly above atmospheric pressure.

The accompanying illustration shows the Pratt & Whitney "Wasp" engine with a built-in General Electric supercharger, Scintilla magnetos and Eclipse electric starter.

SEC'Y. MAC CRACKEN'S BUSY SPEAKING TOUR

ASSISTANT Secretary William P. MacCracken, Jr., Aeronautics Branch, Department of Commerce, has recently completed a speaking tour including three central western states. Mr. MacCracken detailed the work and program of the Department of Commerce on November 22d before the Chamber of Commerce at Omaha, after which he was flown by Lieutenant Morrison of Fort Riley to Mason City, Iowa, where he spoke before the Chamber of Commerce of that City. On November 23rd Mr. MacCracken attended the Army-Navy Luncheon, which was given in honor of Commander Richard E. Byrd, at Chicago. On November 26th he visited Hammond, Indiana, and spoke before the local Chamber of Commerce. From Hammond he returned to Chicago and thence to Washington, arriving at the latter November 29th.

On December 13th Mr. MacCracken left Washington for Dayton where he talked at McCook Field. He was flown from there to Muncie, Indiana, where he spoke before the Chamber of Commerce. On December 14th he addressed the Chicago Section of the Society of Automotive Engineers. On December 15th he spoke before the Chamber of Commerce at Youngstown, Ohio, and returned to Washington on the 16th.



The 3-engined De Havilland "Hercules," the new Egypt-India air liner.

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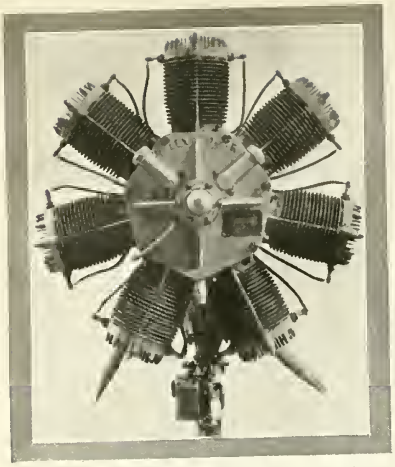


Propeller end of the new Bailey engine.

AVIATION INSURANCE POLICIES LIBERALIZED

INCREASED safety conditions surrounding the growth of commercial aviation throughout the world have been recognized by The Travelers Insurance Company of Hartford, Conn., which has announced a liberalization of the flying prohibition upon holders of all but a few of the company's restricted class accident policies.

Effective December 1, President Louis F. Butler announced, the company will pay indemnity, without additional premium costs, to the extent of the basic insurance provided in approximately 80 per cent of the company's accident policies, for any loss caused by any hazard of aviation while the insured is riding as a passenger in a licensed passenger airplane or dirigible operated by a licensed pilot upon a regular passenger route between definitely established airports.

The extension does not cover injuries suffered in any military or naval plane or dirigible or in any form of unlicensed aviation or travel, or while the insured is acting as pilot or mechanic of a plane or lighter-than-air craft.

Heretofore accident policies have exempted payment of the indemnity for injuries suffered in aviation accidents unless a high additional premium charge has been assessed previously to cover the hazards.

The liberalization, vice-president B. A. Page said, was the result of a conviction on the part of Travelers officials that commercial aviation is no longer an experiment, but that "it is here to stay, has a great future and we want to do our bit to help it grow."

Actual surveys, he added, proved that the hazards of regularly licensed commercial air lines were not much greater than those besetting pedestrians or the occupants of automobiles.

These surveys were instituted primarily as the result of inquiries from policy holders of The Travelers who intended to visit Europe and travel there on the commercial air lines which have been operating successfully for years. Inquiries also have been received from policyholders desiring to patronize the licensed commercial air lines which are rapidly being established in the United States.

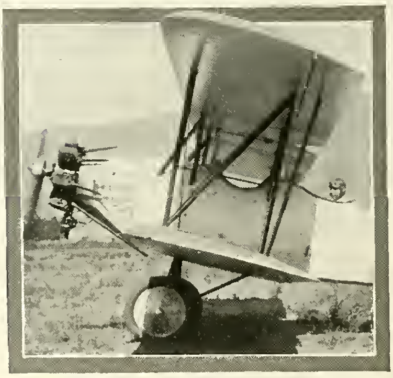
THE BAILEY ENGINE

THE Bailey Model C-7-R aviation engine is a 7-cylinder air-cooled fixed radial engine with a bore of 4⅜ inches and a stroke of 5½ inches, developing 140 horsepower at 1,850 r.p.m. and weighing only 325 pounds, mounted and ready to run.

An important feature making it particularly adapted to commercial uses is its extreme simplicity. The engine, measuring only 31 inches in diameter, contains only 79 moving parts, encased in a three-piece crankcase of heavy aluminum with all joints ground, entirely eliminating the use of gaskets.

The L head valve action not only does away with complicated overhead mechanism, but also makes possible the flanging of the cast aluminum cylinder head, thus increasing the cooling area of the cylinder. The L head principle also makes possible the lifting of the valve in a direct line from the cam.

The cylinders are cast of semi-steel, heat treated, and with the exhaust and intake ports on the rear to assure a more even cooling of the valves. The cooling flanges are deep and are responsible for the cool operation and low oil consumption of the engine.



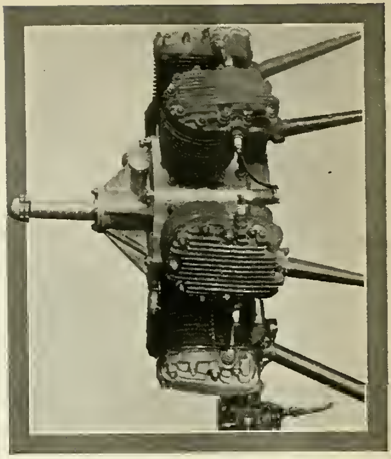
Bailey engine tested in a Romair plane.

The pistons weighing only 2¼ pounds each carry four rings and are made of a special hard, but not brittle alloy.

Connecting rods and master rod are of Chrome Vanadium dropforged steel, with master rod bearings of the conventional babbitt bushing type; length 3½ inches. The Chrome Vanadium crankshaft is of the two-piece type; it rides in 4-inch main bearings also of the babbitt bushing type.

OWEGO, N. Y., FIELD

ON the roof of the Ahwaga Hotel, Owego, N. Y., there is painted the word "Owego" and an arrow pointing true north. Owego is about half-way between New York and Buffalo in the southern tier of the state. The broad valley and wide Susquehanna river makes it possible for either land or seaplanes to make safe landings there. The flying field is one mile west of the town and will be marked with a circle and fitted with a wind cone.



Side view of the Bailey aircraft engine.

GUGGENHEIM GIFT TO UNIV. OF MICHIGAN

APPROPRIATION of $78,000 for completion of the Aeronautical laboratory and for the establishment of the Daniel Guggenheim professorship of applied aeronautics at the University of Michigan, Ann Arbor, Michigan, has been authorized by the members of the Daniel Guggenheim Fund for the Promotion of Aeronautics.

Of the appropriation, $28,000 will be used to complete laboratory apparatus and to construct new testing and research instruments. The remainder of the appropriation will be paid in installments of $5,000 a year over a period of ten years for the establishment of the professorship.

The course in aeronautical engineering at the University of Michigan was started about ten years ago, and is now one of the regular four-year courses leading to the degree of bachelor of science in engineering.

FLORIDA AIR NEWS

By Don. C. McIntosh

THE East Coast Aviation Camp, the latest addition to Florida's aeronautical activities, began operations recently at the Municipal Field, Hialeah, Florida, offering complete flying service. Two Waco 9 planes are in use at the present time, and the camp expects to purchase another in the near future, as business is increasing rapidly.

The personnel of the organization includes Billie Randall, manager, and "Les" Lewis, pilot in charge; L. Needham, chief mechanic. Pilot Lewis began his flying career several years ago at the Curtiss Florida Aviation Camp. Since then he has done a great deal of cross-country flying, instruction and photographic work, also advertising and sightseeing flights. He is a sane, conservative pilot, and is a favorite with passengers, allowing none of his ships to be stunted. The camp has an excellent mechanic in the person of Mr. Needham, who has had extensive experience in Army and commercial aviation. Visiting pilots are always welcome at the field where gas, oil and other supplies may be purchased.

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THE ADVANCE AIRCRAFT COMPANY
TROY, OHIO

BOSTON AIRPORT NEWS

By G. W. Hamblin, Jr.

THE first of the three three-engined Fokkers for the Colonial Air Transport line was flown into the airport on December 7. Leroy Thompson was at the controls, and the ship had as passengers: Maj. Gen. O'Ryan, president of Colonial Air Transport; Maj. Gen. O'Ryan's daughter; J. T. Tripp, vice-president of the company, and Capt. Biddlecomb, late of the British Army, and the British Air Ministry. Two hours were consumed on the trip from Hadley Field.

Leroy Ponton D'Arce, known as "Bon Bon," holds the record for big game hunting at the port. While on the way up from New Brunswick, N. J., he was attacked by a pre-historic monster, savagely bitten and almost thrown for a loss. When about five miles south of Bethany, he was startled out of his reverie by the appearance of a mouse in his flying suit. By skillful maneuvering he side slipped into somebody's back yard, imitated Gilda Gray in her famous shimmy, and put the Charleston dancers to shame with his performance. After shedding all his clothes, 'twas a cold day too, he captured the beast. And so—a mouse delayed the mail forty minutes!

A Pitcairn Fleetwing came in on November 21 with George Maxim as pilot and Al Smith as photographer. They got a good break in the weather, and cleaned up their work in short order.

Frank Kyser landed in an Alexander Eaglerock on the first of December. He showed us an "astounding take-off" all right, pulling his wheels off the ground after running about the length of a match.

B. F. Billings, chief pilot of the Boston Airport Corp., recently gave the kiddies a treat, impersonating Santa Claus. The Houghton Dutton Company gave him the job of flying around at night with "Santa Claus" painted on the bottom wing, and with a battery of spot lights furnishing the illumination. The field was flood-lighted (?) by means of two buckets of gas. Billings claims he made better landings in the dark than he does in the day-time, if that can be possible.

Frederick L. Ames, with his mechanic, C. B. White, are planning a trip to Miami Beach, Fla., in his Whirlwind Travel Air, leaving the port about December 20. They intend having Christmas dinner in Miami, and hop over to Cuba for New Year's.

H. S. "Red" Chandler, one of the student mechanics of the Airport Corp., is going down to Hadley Field to meet Kyser and his Eaglerock, and from there they will proceed to West Palm Beach, Florida, on a sales trip.

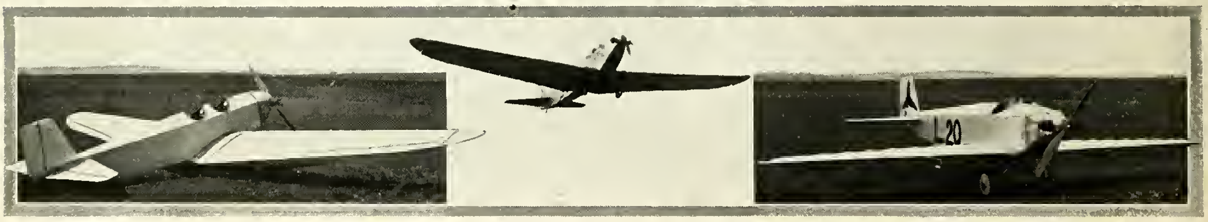
During the latter part of November, Boston was swept by a series of high winds. During one of the squalls Tom Croce's Canuck and Al Backstrom's Jenny were washed out. Both ships were torn loose from their moorings, tossed around in the air for a few seconds, and then dropped back on the runway. Croce surprised everybody by having his ship back in the air in three weeks' time.

BALLOON TROPHY GIVEN TO BOETTNER

THE Detroit News balloon race trophy has been presented to John A. Boettner, of Akron, Ohio, a pilot of the Goodyear Tire & Rubber Company's aeronautic organization, who was winner of the last race from Dearborn Airport sponsored by the Detroit newspaper, August 22.

With the acquisition of the Detroit trophy, Akron balloon pilots now hold all the major ballooning trophies in existence, including the new James Gordon Bennett cup, the Litchfield trophy for National Races in the United States, the Major Thomas Baldwin cup for balloons of 35,000 cubic feet capacity, and the Ohio Flying Club trophy for distance and duration.

Boettner is a veteran balloonist having made more than 1,000 flights in the last 10 years. He was a participant in the 1926 National Race from Little Rock, Ark., making a place on the International team representing America in the race this year.



The Mercedes-Daimler L-20 light plane may be used as a two-seater or a single-seater as illustrated above.

MERCEDES-DAIMLER

AFTER the experiences with the Daimler light plane L-15 and after a series of flight and wind tunnel investigations, the Daimler Motor Company in Germany built the two-seater light airplane, L-20. At the same time a well adapted light motor was produced—the 885 cubic centimeter Mercedes of 20 h. p.

In hundreds of flights, many of them in heavy weather, this airplane demonstrated its fine flying qualities. Every effort was made to insure fair high speed and minimum landing speed, short take off and landing run, and easy steering ability. These qualities make it particularly adaptable as a school plane for beginners, an economical practice plane and also as a private plane for business, travel and sport.

Both cockpits of the L-20 are equipped with complete air controls with all necessary instruments and motor controls. Space is provided for tools and other small articles. Starting of the engine is accomplished directly from the pilot's seat.

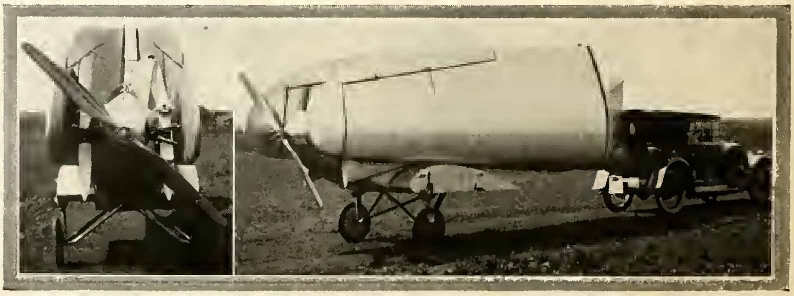
With a view of convenient housing and for the transport of the plane in the streets, a simple dismantling has been devised; the wings are unfastened and hung alongside of the body. It can be dismantled in five minutes, and assembled again in ten minutes.

For sport purposes the large area (20 sq. m.) can be exchanged to the smaller "sport area" (10 sq. m.) in about an hour's time. In this instance the L-20 may be converted to a single-seater. Its landing speed is increased to 55 km. per hour, and its maximum speed is increased to 125-130 km. per hour.

The 20 h. p. air-cooled Mercedes engine has two opposed cylinders of 74 mm. bore and 100 mm. stroke.

The general specifications of the standard L-20 are as follows:

Wing span	13 meters
Wing area	20 square meters
Length	7.3 meters
Height	1.75 meters
Weight, empty	220 kilograms
Useful load	170 kilograms
Weight, loaded	390 kilograms
Wing loading (per sq. m.)	19.5 kilograms
Power loading (per h. p.)	19.5 kilograms
Speed range	60 to 100 kilometers per hour
Cruising speed	90 kilometers per hour
Ceiling	3,500 meters



With folded wings, the Mercedes-Daimler plane is easily transported.

DETROIT NEWS

By Frank Bogart

DETROIT-MADE airplanes (two four passenger, enclosed cabin Stinson-Detroiters) are now operating in the Red Lake gold mining region of Northern Canada for the Canadian Air Express.

With less than six months production behind it the Stinson Aircraft Corporation has built and sold more than a dozen of these machines and is represented on lines in Florida and the Northwest, as well as among private owners about Detroit.

Among their purchasers are Horace E. Dodge, Jr., and John Duval Dodge, sons of the late motor magnates.

William B. Stout, Frank W. Blair, George M. Holley, Carl Keller, and Newton Skillman, all prominently engaged in Detroit financial and industrial circles, have backed up their investments in the city's several aircraft enterprises by clubbing together to purchase one of the Stinson machines.

The Michigan Commercial Aviators' Association was organized at its annual meeting December 16 in Lansing, the state capital, as the Michigan Aircrafters' Association. There are only 17 pilots in the group who are now eligible for the new federal licenses but it is expected their number will be greatly augmented in the coming year. Officers elected for 1927 are: E. A. Goff, Jr., Battle Creek, president; Austin Narrin, Lansing, vice president; C. C. Bryant, Lansing, secretary-treasurer; Lenton T. Knowles, Battle Creek and A. J. Piersol, Kalamazoo, members of the advisory board.

Captain E. V. Rickenbacker has announced the following data on the horsepower developed by his new radial, air-cooled motor, after it had been run 108 hours in the air, the last 25 wide open, and 60 on the block, also wide open: At 1800 r. p. m., 61; at 2000, 68; at 2400, 80. The cruising speed is reached at 1900 r. p. m. The engine was in perfect condition when dismantled. The flight tests were made in the "air coupé" designed by Ivan H. Driggs, Dayton, Ohio.

At least two more new aviation motors are being developed here. Glenn Warner and Warren Noble are the designers of these new motors. Both have received ample financial backing and are making swift progress with their experimental work. Still another group, not so far advanced, is reported considering experiments with an engine of the turbine type.

The seven cylinder radial air-cooled engine the Continental Motors has developed on the Argyll sleeve valve patents will be on exhibition at the three leading automobile shows this month in New York, Detroit and Chicago.

Many new things are in the air around Detroit. Sometimes a stranger on a visit gets more of an insight into the real doings behind the screen than the local watchdogs of the press who are on the qui vive for the slightest scrap of news.

This may have been true in the case of Cornelius Vanderbilt, Jr., who took another whirl at journalism recently and came out to look over the Ford airport and the new aircraft shops, having previously made the acquaintance of William B. Stout.

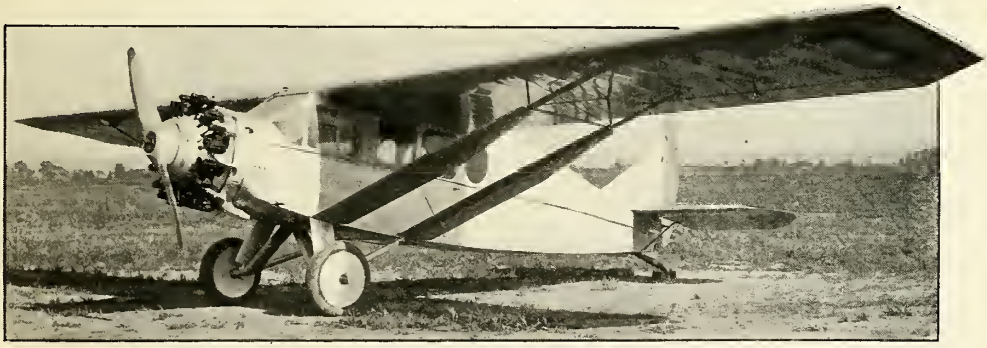
At any rate Cornelius reports that he learned the Fords are preparing to turn out "by the thousands" a light two-seater machine, all of metal, a monoplane, capable of landing on either water or land, and powered with two 60 horsepower motors.

There is more than a grain of truth to this, although the type of machine upon which quantity production is to be concentrated has not as yet even reached the test flight stage. It will be radical in appearance. Some accounts have it that the machine will not be a monoplane, but will have two wings, fore, and aft. The forward wing will be below the fuselage and the rear one level with the top of the fuselage. These wings will be detachable. The plane will have a third wheel and the pilot will be able to steer it by means of this, when, after landing, a a small motor is set going to enable him to bring his machine from the flying field to any point where he wishes to store it, under its own power.

TWO AIRWAYS LIGHTED

ONE-HALF of the lights on Route 2 of the airways, from Chicago to St. Louis, and Route 3, Chicago to Dallas, will be turned on by Christmas, it was announced by the Aeronautical Branch of the Department of Commerce. Route 2 covers a distance of 257 miles and Route 3 a distance of 501 miles.

THE BELLANCA "PACER"



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RECORD OF WHIRLWIND ENGINES DURING 1926

ONE of the most interesting reports on commercial aviation in America has been made by the Wright Aeronautical Corporation of Paterson, N. J. It consists of detailed information of the service rendered by thirty-two commercial aircraft operators using Wright "Whirlwind" engines in different types of commercial aircraft. This remarkable survey does not record the miles flown by Wright "Whirlwind" engines in use by the U. S. Army Air Corps or the U. S. Navy. Neither does it include the flying time of Wright motors used in the Heinkel twin-engined plane in Germany, the Russian Air Service, the Italian Air Service, or the Air Services of Cuba, Peru, Argentine or Brazil.

By January 1, 1927, Wright "Whirlwind" engines in the United States and Canada will have flown during the past year 1,774,268.8 miles, or a distance equal to 71 times around the earth at the equator. Only three forced landings due to motor failure were recorded. This brings out the remarkable record that for each forced landing due directly to engine trouble the Wright engines flew a distance equal to 24 times around the earth. One forced landing was recorded when the Wright J-4 was placed for test purposes in an experimental plane, and the other two were caused by high speed operations flying close to the ground when carrying on the work of dusting fruit trees and cotton crops.

In all, these thirty-three commercial aircraft operators used 104 Wright engines, securing an average fuel consumption of 7.03 miles per gallon. The oil consumption of these motors averages three pints per hour, while the average gas consumption is 11.5 gallons per engine hour. The average air speed recorded in the eighteen types of commercial aircraft is 90 miles an hour.

The majority of these thirty-three commercial aircraft operators who established this phenomenal record of safety in commercial air transportation had been in business for only approximately six months.

The report consists of a statement from the commercial aircraft transportation companies of 16,462.55 hours flown to December 1, 1926, with an estimated 1,503 hours to December 31. This brings the total miles to December 1, 1,629,343.8; to December 31, the estimated miles 144,925; with the total miles for 1926, 1,774,268.8. The total gas consumed is 220,343 gallons; oil, 7,641.6 gallons.

The Philadelphia Rapid Transit flew 319,680 miles with only $75.55 cost for engine parts, and averaging 10½ gallons of fuel per engine hour on their 255 mile route between Philadelphia, Washington and Norfolk, using 12 "Whirlwind" engines exclusively in their Fokker planes. The Varney Air Mail Service flew 189,326 miles on their 520 mile route across the Rocky Mountains from Salt Lake City to the state of Washington with only $78.00 as the cost of engine parts on the seven "Whirlwinds" used in the Swallow planes.

Charles L. Lawrance.

Richard F. Hoyt, Chairman of the Board of Directors; Charles Lawrance, president; Guy Vaughan, vice-president, and C. G. Peterson, all of the Wright Aeronautical Corporation, are enthusiastic about the outlook for commercial aviation for 1927.

NEW ENGLAND NEWS

By Daniel Rochford

THE outstanding aviation event of December in New England was the flight of the first air liner built for and owned and operated by a New England air company in New England. Early in the month, December 7th, the "Chicago," a new trimotor Fokker with chairs for eight passengers and space for two more chairs when the liner is put into regular service, flew to Boston carrying Major General John F. O'Ryan, William Rockefeller, and a group of officials and guests of the Colonial line to attend a special luncheon in their honor given by the Boston Chamber of Commerce.

Two demonstration flights were given over Boston and a number of prominent financial men, a half dozen newspapermen and photographers were given a ride. The flights were made onto the Boston Airport which was blanketed by from a few to fourteen and more inches of snow. The wind had swept the edge of the long runway fairly clear so the plane could land easily. In the afternoon the liner took off for the return to New York.

The day before, the Fokker Universal single motored ship at the Colonial landed in the then much more dangerous snow and brought the mail through in a manner which attracted wide newspaper comment and even provoked the following poem, reprinted from the *Boston Evening Transcript*.

The Mail Plane
(*December* 6, 1926)

High overhead in the snow-filled sky,
  Bucking a northeast gale,
Were the silver wings of the Fokker plane
  That carried the New York mail.
She steadily, stubbornly nosed her way,
  Against the whole storm's force
Of bitter wind and blinding snow
  She kept her winged course.
"Happy landings!" to the pilot
  Who flies when storm clouds blow,
And brings his airplane through today
  Because the mail must go!
—E. D. B.

Early in the month your correspondent visited Bangor, Maine, to see what is going on there in the flying world. One privately-owned plane, an Avro, is flying, or was flying until the heavy snows came. It did a Santa Claus stunt for a local department store's Christmas sale. A ground school was being started at $5 per week, three nights weekly instruction. A JN, flown to Bangor last spring but not operated thereafter, furnished part of the instruction equipment.

We found the local Chamber of Commerce disgruntled that more had not been accomplished in Bangor. The old story of too large promises and too little real conception of expense of aviation and the support needed to get a real aviation center steaming, is to blame for the feeling. The non-initiate business men still believe in the "highways of the air" which run everywhere and which need no tracks or stations down below. They do not realize that your airway must first be run along the ground with intermediate fields at necessary intervals, ground communication and weather organizations, and well-equipped terminal fields for the air liners to base on.

We then took a drive down Lucerne-in-Maine way. There on Phillips Lake the backers of this great land promotion scheme have planned for seaplane anchorage. There is a golf course on the hillside and small ships could probably get onto it but not for commercial operations until more is done.

Going on to Bar Harbor we found no great amount of interest in air transport. Of course, there are landing facilities in Bar Harbor. Two of them have been marked

The tri-motored Fokker, "Chicago," arrives with eight passengers at Boston airport.

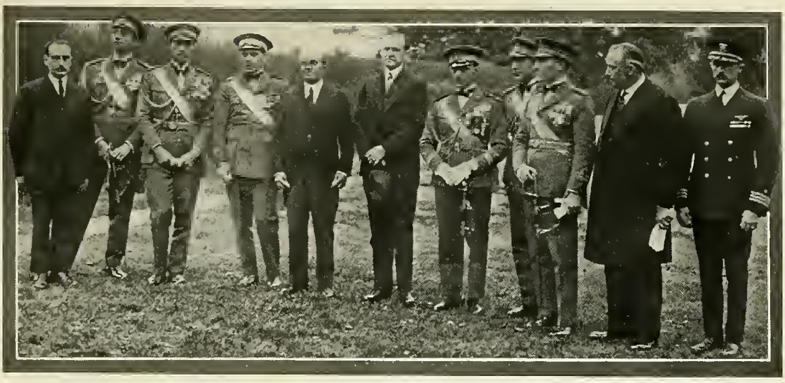
by the Hydrographic office off Bar Island. But there are no good land fields apparently available.

At Northeast Harbor we found a good open area of about seven acres which, with some smoothing of the surface where a roadway cuts across it, would furnish a possible landing field in favorable winds. It would be limited though because of the one-way character of the open land, woods on either side preventing other approach or take-off than the long way. No seaplane anchorage has been marked but available water exists. Some time, next year or more likely in 1928, a seaplane line from Boston to Bar Harbor and Northeast Harbor could make profitable occasional trips. There is a very wealthy summer colony at both places to whom the time saving of the air way would be worth a great deal.

Bath, Belfast, Boothbay Harbor, Camden, Eastport, Millbridge, Rockland and Portland, all have charted seaplane anchorages.

Squantum, Mass., has been comparatively inactive during the month, a total of perhaps twenty flights having been made. A TG has been rebuilt by Lieut. Reginald D. Thomas and his station crew. Marines are to be trained at Squantum if the five-year program funds are made available by the present Congress.

The regulars at the Boston Airport lost Flight Surgeon Lyle C. White by transfer to the Philippine Department the 22nd of the month. Staff Sergeant George Schmidt left at the same time for Luke Field, Hawaii. Schmidt had been at the port since its founding.



© *International.*

President Coolidge greets the Italian Schneider Cup winners.

Left to right:—Engineer Ferretti, Lt. Adriano Bacula, Capt. Arturo Ferrarini, Comdr. Silvia Scaroni, Air Attaché of Italian Embassy, Giacomo de Martine, Italian Ambassador, President Coolidge, Maj. de Bernardi, winner of Schneider Race, Maj. Guglielmetti, Engineer Castoldi, designer of Italian planes and Comdr. J. L. Callan, U. S. N.

The Department of Commerce went ahead with the plans for a beacon light adjoining the muster field at Framingham, Mass., permission to put a light on the field being beyond the present authority of the Massachusetts military authorities to grant.

Aviation committees have been appointed by the posts of the Massachusetts American Legion and a bill is to be introduced at the session of the Massachusetts state legislature to convene early in January which will provide for moving back the four service and one commercial hangar now at the Boston Airport to permit the utilizing of the entire area there for flying surface. The Bay State Legion air committee is headed by Capt. R. F. Raymond, Jr., a war-time pilot of the 27th Pursuit Squadron, D. S. C. and Croix de Guerre and the first man in his squadron to bring down an enemy in combat. Maj. Charles M. Wooley, Mass. National Guard air service, is working with the Legion committee and Capt. Gardiner H. Fiske, Chairman of the Municipal Air Board at Boston, is also active.

INFORMATION WANTED

ANYONE knowing the whereabouts of any relatives of the late Jimmie Ward, one of the pioneer American pilots, will confer a favor by advising this office where they may be located.

Light your Airport

Transportation will always demand night-time as well as day-time operation. Therefore, for your airport to be fully equipped for commercial aviation, it must be correctly lighted for night flying.

G-E Aviation Lighting Specialists assisted the U. S. Air Mail Service in lighting its airports and airways for night flying, and the experience and information these men possess will prove most valuable in helping you select the correct lighting for *your* airport.

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NEW SAFTIBOATS

AFTER a year of experimental work, during which time they have built eight test boats and delivered a quantity of boats to customers, the Brownback Motor Laboratories, Inc., are bringing out their 1927 model Saftiboat. The first two models to be completed will be a 25-foot runabout and a 16-foot runabout. The former will be powered either with a 120 h.p. improved Hall-Scott engine or a 180 h.p. Hispano-Suiza, giving speeds in excess of 50 m.p.h. This boat has the well known Dumond-Galvin bottom construction and steering gear, is built of mahogany "V" bottom forward with a shape of bow which has been carefully developed to eliminate pounding when driven at high speed into choppy water.

The little 16-footer will be built in quantity production for the Brownback Company by Airplanes, Incorporated, of Hammondsport, New York. By having aviation pontoon builders construct these hulls, men who have been accustomed to working for the strictest Government inspection, they are able to produce a small boat which has never been equaled in lightness, strength, accuracy of workmanship and high finish. Airplanes, Inc., built the "Baby Buzz" type boats which cleaned up the Outboard Motor Boat Race at the Gold Cup and the Ball Mountain Race.

It will be fitted for ordinary use with a 2-cylinder 7 h.p. Anzani engine turning 1,600 to 1,700 r.p.m., and an entirely new type of propeller, made of spruce and sheathed entirely in aluminum, developed by the company in connection with the Paragon Engineers, Inc. For sport use the company has developed, with Monsieur Anzani, an 18 h.p. engine of the same weight, turning 2,500 r.p.m., which greatly increases the speed. The hull is "V" bottom forward running into the lines of the Dumond-Galvin bottom, so that it can be driven through ordinary seas at full speed.

DURALUMIN - PLYMETL TESTED FOR AIRCRAFT

A NUMBER of aircraft builders are experimenting with a new product called Duralumin-Plymetl, similar to the well known Haskelite structural plywood and produced by the same organization. It has a core of plywood with a surface sheet of duralumin glued to the wood giving maximum weight combined with a surface that requires no finishing.

VACUUM COMPANY'S AERO. DIVISION

THE Vacuum Oil Company has established a special branch to cover aeronautics in order to furnish the aircraft industry the same service it is rendering the automotive trades.

E. J. Snow and L. B. Umlauf of the Company have recently returned from a trip to the central west for the purpose of meeting aircraft manufacturers and operators in that section of the country. They report favorable conditions for this time of the year and look forward to big developments during the coming spring.

MATERIALS

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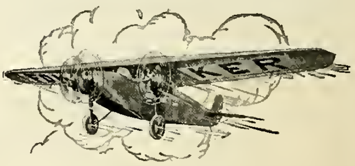
MODELS



Work Out Your Ideas with a Model Airplane!

Do your experimenting on an accurate Model of a real airplane. You can build one easily and quickly with an IDEAL Model Airplane Outfit. These outfits contain all parts, materials and supplies, including Plans (Drawn to Scale), Forming and Assembling Layout and full Building and Flying Instructions for any of the planes listed below. Models are scientific copies of real machines; have parts and fittings like big airplanes, hand-carved propeller, formed ribs, rubber-tire disc wheels, ball-bearing propeller shaft, aluminum cowling and radiator and other features which duplicate the original machines. Each outfit is complete; there is nothing more to buy. Here are the three most popular models:
FOKKER North Pole Plane: 3 ft. size
Complete Construction Outfit $8.50
De Havilland World Flyer: 3 ft. size
Complete Construction Outfit 7.50
JN4D—2 Curtiss Plane: 3 ft. size
Complete Construction Outfit 7.00
Orders filled immediately upon receipt of price.
Complete plans and building-flying instructions for any of the above Models, sent postpaid for 25c. each.
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SCHWAB PRESIDENT OF SPLITDORF COMPANY

EDWARD H. SCHWAB, brother of Charles M. Schwab of the Bethlehem Steel Corporation, was elected president of the Splitdorf Electrical Company at the November meeting of the Board of Directors. He succeeded M. W. Bartlett who has retired from the business.

Mr. Schwab has been chairman of the Splitdorf Board since 1924 when the Company joined forces with the Bethlehem Spark Plug Company, of which he was president.

R. W. Porter, sales executive, has been appointed General Manager of the Company. Mr. Porter was formerly radio sales manager, and was previously associated with the Winchester Repeating Arms Company, the Columbia Phonograph Company and the R. E. Thompson Manufacturing Company.

RUNNING TIME CUT ON TRANSCONTINENTAL

A CHANGE has been made in the transcontinental air mail schedule east of Chicago. Dispatch of air mail from New Brunswick, N. J., was advanced one hour and thirty-five minutes on December 15. The new schedule permits mail prepared the same morning of dispatch to catch the westbound plane.

No changes are made in the schedule on lines west of Chicago. The difference is made up between that city and New York with the faster Douglas planes now in use. The arrival time in San Francisco is 4:30 p. m., the following day, as at present. The change in schedule was made possible under an arrangement with the Pennsylvania Railroad, whose trains stop at New Brunswick, the air mail terminal.

BYRD POLAR PLANE COMPLETES TOUR

THE Byrd North Pole plane, Josephine Ford, piloted by Floyd Bennett, completed the 7,500 mile coast-to-coast tour of the United States on November 23. The trip was made through the courtesy of Commander Richard E. Byrd, in coöperation with the Department of Commerce, and financed by the Daniel Guggenheim Fund for the Promotion of Aeronautics. During the trip more than forty cities were visited on schedule without mishap or delay of any kind.

The members of the crew of the plane participated in the opening of many new municipal airports, and in each stop delivered talks on the usefulness to modern business of municipal landing fields, especially along the existing air routes.

GOVERNMENT BIDS

PROPOSAL FOR SPECIAL TYPE OBSERVATION AIRPLANE.—Office of the **Contracting Officer**, McCook Field, Dayton, Ohio. Sealed proposals will be received here until **10:30 A. M. April 4, 1927 for the development of a special type observation airplane and furnishing proposed airplanes in quantities of one, two or three at Government's option for test, with option to place additional order for ten airplanes if test of smaller number so warrant.** Further information on application.

CHICAGO AIR NEWS

IN THE past seven months the Pal Waukee Airport Company, Swallow airplane distributors, have converted a bare field at Mount Prospect, a suburb of Chicago into a modern airport complete with shop equipment, service station and hangars. They have flown 25,000 miles and carried 974 passengers.

Chicago operators, pilots, mechanics and exhibition men have recently organized The Aircraft Operators Association. They held their first air meet at Yackey Checkerboard field on November 11th, with various events which proved quite a success, considering bad weather conditions.

In any event—

SOCONY
REG. U.S. PAT. OFF.

Lieutenant Byrd's North Pole Plane filling with Socony Aviation Gasoline, Buffalo Airport, October 12, 1926.

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SOCONY
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(*Continued from page* 18)

adequate reserve gasoline supply tank or satisfactory and reliable apparatus for indicating to pilot a depletion of the gasoline supply;

(B) (1) An engine of new type and design must be bench tested for not less than 50 hours, of which at least 5 hours must be at full throttle. A log of such test must be filed with the Secretary of Commerce; (2) A newly constructed engine of a type and design which has been tested in accordance with the provisions of sub-paragraph 1 hereof, must not be installed in an airplane until bench tested for at least two hours, during at least one-half hour of which the engine must be run at full throttle; (3) An engine which has been in storage for more than one year must not be installed in an airplane until it has been re-conditioned in accordance with accepted safety practices; (4) A reconditioned engine must be run for at least 20 minutes at full throttle before it shall be used in propelling registered aircraft carrying persons or property for hire or reward.

15. Equipment and Instrument Requirements: The equipment and instruments required, which must be serviceable and in operating condition, are:

(A) *Equipment:* (1) Fire extinguishing equipment, of design approved by the Secretary of Commerce. Cabin airplanes carrying passengers for hire or reward must be equipped with at least one portable extinguisher accessible to the passengers; (2) First aid kits on airplanes carrying passengers for hire or reward: (3) Safety belts or equivalent apparatus for pilots and passengers in open cockpit airplanes carrying. passengers for hire or reward;

(B) *Instruments:* (1) Tachometer for each engine; (2) Oil pressure gauge where oil pressure systems are employed; (3) Water thermometer for water-cooled engines and oil thermometer for air-cooled engines; (4) Altimeter.

16. Propellers: (A) Propellers must have: (1) Ground clearance of at least six inches when plane is in horizontal position; (2) At least three inches of clearance, on multi-engined land and seaplanes, between tips of the outboard propellers and the fuselage or any of the plane structure.

(B) Propellers must be balanced and wooden propellers must be without open glued joints, and

(C Propellers must be of a type design approved by the Secretary of Commerce.

17. Materials and Workmanship: The materials used in airplanes and engines must be of accepted standards and clearly adapted to the purpose for which used. and the workmanship must be good.

18. Seaworthiness of Seaplanes: Seaplanes, including amphibians, must also be seaworthy.

19. Formulae or Flight Test: (A) Except as provided in sub-paragraph (B), all airplanes, other than seaplanes, whether constructed before or after these regulations take effect, must meet the calculations of both of the following formulæ:

$$(1)\quad \frac{\text{Gross weight}}{\text{Horsepower}} \times \frac{\text{Gross weight}}{\text{Wing area}} = 200 \text{ or less.}$$

$$(2)\quad \frac{\text{Gross weight}}{\text{Horsepower}} + \frac{\text{Gross weight}}{\text{Wing area}} = 30 \text{ or less.}$$

(B) If either calculation is in excess of the figures stated above, the airplane must pass the following flight tests with full load: (1) Take-off within 1000 feet; (2) Climb at least 250 feet the first minute after taking off, and (3) Land, coming to full stop without external aid, within 1000 feet from point where wheels first touch the landing area.

Tests are to be calculated upon the basis of air of a specific weight of .07635 and of wind velocity not exceeding 10 miles per hour.

20. Manufacturer's Number and Date: The date of manufacture or date of remodeling and the name of the manufacturer or remodeler, together with the serial or other number, must be permanently affixed to a visible and protected part of the licensed aircraft in order that it may be distinguished from other aircraft.

21. Manufacturer's "Approved Type" Certificates for Airplanes: (A) *Application:* A manufacturer of airplanes in quantities and of an exact similarity of type, structure, materials, assembly and workmanship may, at the option of the manufacturer, file with the Secretary of Commerce, an application for an "approved type" certificate.

(B) *Accompanying information:* The application must be accompanied, under oath, by: (1) Three view drawings of the airplane with main dimensions, aerodynamical and other characteristics, accompanied by a balance diagram for varying conditions of load to be employed; (2) Description of power plant and power plant installation with illustrative diagram; (3) Description of wings, fuselage, including engine mount, landing gear and tail surfaces, materials employed, and drawings or dimensioned sketches of main structural members;. (4) Stress analysis, with signature of the reponsible engineer.

The information furnished by the manufacturer under sub-paragraphs (A) and (B) will be treated as confidential.

(C) *Inspection and tests of specimen:* If the Secretary of Commerce approves the submitted design and the aircraft meets the requirements of Section 19, it will be inspected for exact similarity with the submitted design and specifications. Upon passing such inspection the airplane must undergo the flight tests prescribed in Section 26. If such tests are passed the Secretary of Commerce will issue to the manufacturer an "Approved Type" Certificate.

(D) *Duration and conditions of approved type certificates:* The approved type certificate will be issued upon the conditions that each quarter the manufacturer will file its affidavit with the Secretary of Commerce showing the number of airplanes constructed under the approved type certificate during the quarter, with a statement that no airplane is being constructed under the approved type certificate deviating from the terms thereof.

(E) *Changes:* Changes in airplanes constructed under an approved type certificate are permissible, with the approval of the Secretary of Commerce.

(F) *Manufacturer's affidavit:* Upon the sale by the manufacturer of airplanes of an exact similarity of type, structure, materials, assembly and workmanship with the specimen for which the "Approved Type" Certificate is issued, the manufacturer may deliver to the purchaser a manufacturer's affidavit, a copy of which is shown in the Form Registry of the Secretary of Commerce.

22. Application for Aircraft License: Before an aircraft license will be issued, the owner must file, under oath, with the Secretary of Commerce, an application for the license upon a blank prepared in conformity to the form of the application in the Form Registry of the Secretary of Commerce. Copies of such application will be forwarded upon request.

23. Licensing of Airplanes Constructed Under Approved Type Certificates: Airplanes constructed under approved type certificates will be licensed as follows:

(A) If the applicant is found to be an eligible owner of aircraft of the United States, and (1) The application is accompanied by the Manufacturer's affidavit, the airplane will be licensed after it has been inspected for similarity to the specimen, has passed the flight test specified in Section 26A, and is equipped as required by these regulations.

(B) An airplane constructed under an approved type certificate and in the original possession of the manufacturer will, at the request of the manufacturer, be given the same inspection and test as are provided for in sub-paragraph (A). If such inspection and test are passed a Flight Certificate will be issued by the Secretary of Commerce for such airplane. which certificate may be delivered by the manufacturer to the purchaser. The certificate will be good for 90 days after its issuance and may be extended for additional 90 days periods upon request of the manufacturer, where the Secretary of Commerce finds that the airplane is in the same condition as when the certificate was issued.

(C) If the applicant is found to be an eligible owner of aircraft of the United States and: (1) The application is accompanied by the Manufacturer's affidavit and the Flight Certificate and (2) The airplane is delivered (assembled) to the applicant either at the factory or by air under its own power, the Aircraft License will be issued to the applicant without additional inspections or tests, provided the airplane is equipped in accordance with these regulations.

24. Licensing of Airplanes Not Constructed Under Approved Type Certificates: (A) If the airplane is of standard design and not constructed under an approved type certificate, the application shall be made on the form for nonapproved type airplanes and accompanied by a statement of the history of the operations, remodeling and replacements of the airplane and engine and their general condition. Statements in the application shall show whether they are made upon the applicant's own knowledge or upon information and belief. If the airplane is constructed after July 1, 1927, the application shall be accompanied by the additional information that is required by Section 21B.

(B) *Tests:* (1) For the airplane constructed after July 1, 1927, in conformity to the airworthy requirements of these regulations and which pass the flight tests specified in Section 26, Aircraft Licenses will be issued by the Secretary of Commerce. (2) For airplanes constructed prior to July 1, 1927, and found by the Secretary of Commerce to be of proper design, assembly and workmanship, and of suitable materials and equipped in accordance with these regulations, Aircraft Licenses will be issued after such airplanes have passed the flight tests specified in Section 26B.

25. Licensing of Special Classes of Airplanes: Racing and experimental airplanes and airplanes of unusual design will be granted special Aircraft Licenses and shall be operated only in accordance with the conditions imposed in such licenses by the Secretary of Commerce.

26. Flight Tests: The flight tests referred to in this chapter are of two kinds:

(A) General flight, which is a one-half hour flying test with full load to determine stability, and

(B) General maneuverability, which, includes among other things, a flight with full load around two pylons or buoys fifteen hundred feet apart, making five successive figure eights at 800 feet without varying more than 200 feet in height, and in a radius not to exceed the following: (1) 500 feet for airplanes of full load not in excess of 4500 pounds; (2) 750 feet for airplanes of full load over 4500 pounds and not in excess of 13,500 pounds; and (3) 1000 feet for all other airplanes.

The applicant must provide the person to make the flight tests, but the inspector will pilot the airplane during such parts of the tests as shall be deemed necessary.

27. Places for Airworthiness Tests: The Secretary of Commerce will fix the time and place for all inspections and tests for airworthiress.

28. Licenses—Contents: Aircraft Licenses will be issued for a period of one year and will identify the airplane, specify the authorized type of the engine. and state the authorized gross weight and will be granted subject to compliance with these regulations.

29. Sale of Licensed Aircraft: Upon the sale or transfer of title of licensed aircraft, the licensed owner must report to the Secretary of Commerce the date and place of sale or transfer and the name and residence of the vendee. If the sale is to an ineligible owner of aircraft of the United States, the Aircraft License immediately terminates. If to an eligible owner, the license terminates 30 days after such sale or transfer, during which time the vendee may file a "Purchaser's Renewable" application, and have the aircraft relicensed in his name for the unexpired term of the existing license. Between the sale and the said relicensing the aircraft will be considered as licensed in the name of the purchaser if the Purchaser's Renewable application is filed within the time provided herein. If the application for the relicensing is not made within the time aforesaid the license of the aircraft will be governed by the regulations applying to original licenses.

30. Relicensing of Aircraft: Upon the expiration of the term of an existing Aircraft License, the aircraft will be relicensed for additional periods of one year upon the application of the owner for relicensing and the finding of the Secretary of Commerce that the aircraft is airworthy and is owned by an eligible owner.

31. Cancelling Licenses upon Request: Upon the request of the licensed owner, the Aircraft License will be cancelled by the Secretary of Commerce.

32. Revocation and Suspension of Licenses—Law: "The Secretary of Commerce shall by regulation—Provide for the * * * suspension and revocation of registration (and) aircraft certificates." (*Sec. 3f*)

33. Ground for Revocation or Suspension: Aircraft Licenses will be suspended or revoked for:

(A) Violating the Air Commerce Act or any of these regulations;

(B) Failing to make proper and seasonable reports;

(C) Making false statement in application or information accompanying the application for the license, or in any report required under these regulations;

(D) Equipping the airplane with a type of engine not specified in the license or approved by the Secretary of Commerce;

(E) Remodeling the engine and using it to propel licensed aircraft without the aircraft having been first re-rated as airworthy by the Secretary of Commerce;

(F) Remodeling the airplane structure and flying the airplane without having it re-rated as airworthy by the Secretary of Commerce.

34. Display and Surrender of Licenses: The Aircraft License must be carried in the craft whenever it is in service and must be conspicuously posted where it may be readily seen by passengers or inspectors. Whenever the craft is found to be unairworthy the license must be removed from the craft, and when the license is suspended or revoked, or when it is no longer in force, it shall be surrendered to the Secretary of Commerce. The license must be presented for inspection upon the demand of any passenger or of any authorized official or employee of the Department of Commerce.

35. Licensing of Airships and Balloons: Until otherwise provided by regulations, the licensing of airships and balloons shall be in accordance with special orders of the Secretary of Commerce.

36. Meaning of Airplane: Except as otherwise specifically shown the word "Airplane" as used in this chapter includes seaplane.

Chapter 2. MARKING OF LICENSED AND UNLICENSED AIRCRAFT

37. Marking of Aircraft—Law of: "The Secretary of Commerce shall by regulation—establish air traffic rules for the * * * identification of aircraft * * *." (*Sec. 2e*)

38. Identification Marks for Government and Special Classes of Aircraft:

(A) For aircraft belonging to the Government of the United States identification marks or symbols will be assigned in accordance with arrangements to be made with the affected departments.

(B) Licensed airplanes engaged in racing or experimental work, or specially licensed for other purposes, will be assigned special identification numbers or symbols.

39. Identification Marks for Licensed Aircraft: A license aircraft shall bear an identification mark consisting of the license number of the aircraft preceded by:

(A) The Roman capital letter C, (meaning Commercial) for craft engaged in the carriage of persons or property for hire or reward, or the United States Mails, or in the furtherance of a business, or navigation from one place to another for operation in the conduct of a business;

(B) The Roman capital letter S, (meaning State) for craft used solely for governmental purposes and belonging to States, Territories, Possessions, or Municipalities, and

(C) The Roman capital letter P, (meaning Private) for all other licensed aircraft.

The mark will be assigned to the aircraft upon the issuance of the Aircraft License.

40. Identification Marks for Unlicensed Aircraft: An unlicensed aircraft, except an aircraft belonging to the Government of the United States, shall not be flown without displaying an identification mark. The Secretary of Commerce will assign to such aircraft the proper identification mark, upon application. The mark will consist of a number only. Where an airplane is purchased from the manufacturer thereof and it is not registered or identified prior to or at the time of purchase, it may be flown to the usual station of the purchaser provided it prominently displays a ferrying number which will be assigned by the manufacturer. Such number shall not be thereafter used and immediate application for either a license or a permanent identification mark must be made. An unlicensed airplane, delivered to a purchaser by other than the manufacturer, may be flown under the identification mark assigned to the vendor, provided, the vendee, within thirty days after

(*Continued on page* 52)

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(*Continued from page* 50)

the date of sale, transmits to the Secretary of Commerce the original bill of sale or a certified copy thereof.

41. Places and Divisions of Marks: Except as may be authorized under Section 40 and 42, identification marks shall be located as follows:

(A) *On Airplanes:* On the lower surface of the lower left wing and the upper surface of the upper right wing, the top of the letters or figures to be towards the leading edge, the height to be at least four-fifths of the minimum chord. If the lower left plane is less than one-half the length of the upper left plane, the letter or figures shall be on the under surface of the upper left plane as far to the left as is possible. The height of the letters or figures shall be at least four-fifths of the minimum chord. The marks shall also appear on both sides of the rudder, of size as large as the surface will permit, leaving a margin of at least two inches.

(B) *On Airships:* On both sides near the maximum cross section and on the lower under-surface of the nose; the height to be equal to at least one-twelfth of the circumference at the maximum transverse cross section of the airship.

(C) *On Balloons:* Twice, near the maximum horizontal circumference, as far as possible from one another, the height to be equal to at least one-twelfth of the circumference of the balloon.

The width of the letters and figures of all marks shall be at least two-thirds of the height and the width of the stroke shall be at least one-sixth of the height. The letters and figures shall be painted in plain black type on a white background, or in any color on any background, but there must be a strong contrast between the two. The letters and numbers must be uniform in shape and size. A space equal to at least one-half of the width of a letter shall be left between each figure or letter.

42. Other Symbols and Marks: Except with the approval of the Secretary of Commerce, no design, mark, symbol or description, shall be placed upon aircraft if it modifies, adds to, subtracts from or impairs or destroys the visibility of the identification mark assigned by the Secretary of Commerce.

43. Identification Plate: The identification mark, with the name and residence of the owner, will be inscribed upon a metal plate furnished by the Secretary of Commerce. It must be affixed to the fuselage in a prominent place, but this section shall not apply to public aircraft of the United States.

Chapter 3. REQUIREMENTS IN THE OPERATION OF AIRCRAFT

44. Continuous Duty as to Flying Condition: After an aircraft is licensed and between the times that it is inspected for airworthiness by an inspector, the owner is charged with the continuous duty of maintaining the aircraft in a good and proper state of repair and flying condition. For violation of this duty or of the inspections required in the next succeeding section, the aircraft license will be suspended or revoked.

45. Daily and Periodic Inspections: A licensed airplane shall be given a line inspection by the owner, at least once within each twenty-four hours preceding flight, and the result thereof shall be entered in the log, under the signature of the person making such inspection. The line inspection must be made to ascertain the working condition and state of repair of the:

(1) Open control wires, all control wires and pulleys open to inspection through apertures, and all hinges on control surfaces;

(2) Landing gear, wheels, fittings and shock absorbers;

(3) Fuselage parts open to visual inspection;

(4) Main plane external bracing, including fittings and struts, external wires, cables, turnbuckles, and fabric or covering;

(5) Control surface fabric or covering;

(6) Engine exhaust manifolds, and exhaust pipe extensions.

The engine shall be given a warming up test during which the proper functioning of the engine instruments shall be ascertained.

(7) Carburetors, and fuel feed lines open to visual inspection to insure proper functioning;

(8) Cooling system and connections;

(9) Cowling, to insure that the cowlings are properly secured and safetied, and

(10) Propellers, as to condition.

(B) After each one hundred (100) hours of flight, in addition to the line inspection, the airplane must be given a "Periodic Inspection", by the owner, and the result thereof must be entered in the log by the person making such inspection. This inspection must be made to ascertain the working condition and state of repair of the: (1) Engine installation; (2) Control systems throughout; (3) Propeller alignment; (4) Fuselage, including fittings, tail skid and tail skid shock absorbers.

46. Government Inspections: The inspector or other authorized officer of the Secretary of Commerce shall be permitted by the owner or operator to inspect the licensed aircraft at any time and place for the purpose of determining its flying condition and state of repair. For such purposes the owner or operator shall give to such inspector or officer free and uninterrupted access to the aircraft and the field or shelter where the craft is located.

47. Solo Flights with Passenger Planes: In addition to the requirements of Section 14 B, licensed airplanes with newly installed engines, old, new or reconditioned, and airplanes upon which major repairs have been made to the plane structure, must be first test flown by a licensed pilot without passengers for hire or reward.

48. Carrying Passengers in Various Classes of Airplanes: A licensed pilot must not carry passengers for hire or reward in an airplane of any one of the classes specified in Section 12 A unless he has piloted an airplane of that class for at least two hours within the last preceding 90 days, except where he makes practice flights in the airplane of such class for at least one-half hour and takes it off and lands it at least ten times. At least three of the landings must be to a full stop.

49. Seaplane Piloting: A licensed pilot must not carry passengers for hire or reward in a seaplane unless he has piloted a seaplane for at least 2 hours within the last preceding 90 days, except where he makes practice flights in the seaplane for at least one-half hour and takes it off and lands it at least ten times. At least three of the landings must be to a full stop.

50. Pilot's Night Flying Qualifications: A transport pilot who has not had at least one hour of night solo flying within the last preceding thirty days must not pilot an airplane with passengers for hire or reward between one-half hour after sunset and one-half hour before sunrise, except where he makes night solo flight tests for at least one-half hour, and takes off and lands at night at least ten times. At least three of such landings shall be to a full stop.

51. Carrying Passengers at Night: Licensed aircraft when engaged in carrying passengers for hire any time between one-half hour after sunset and one-half hour before sunrise must be equipped with landing lights, navigation lights and Very's pistol (or approved equivalent).

52. Compass Requirements: An airplane flying cross country one hundred or more miles and an airplane, including a seaplane, operating over large bodies of water beyond the sight of land, must be equipped with a compass.

53. Supplies and Equipment for Flights over Water: An airplane flying over large bodies of water must be provided with an adequate supply of food and potable water and if engaged in carrying passengers for hire or reward, it must be equipped with a Very's pistol, or approved equivalent, and lights and life preservers or other flotation devices approved by the Secretary of Commerce.

54. Repairs after Accident Reports: After repairs have been made on licensed aircraft which has been seriously damaged, the licensed owner shall make full report to the Secretary of Commerce of the kind and extent of repairs made to the craft.

55. Flying Seriously Damaged Airplanes: A licensed airplane which is seriously damaged must not be flown with passengers for hire or reward until it has been fully repaired and its flying conditions approved by an inspector.

56. Accident Reports: Where serious injury to person or property is suffered or death results in operating licensed aircraft, the owner of such aircraft shall immediately report, by telegraph or telephone, to the Secretary of Commerce, the license number of the aircraft and the time and place of the accident. All accidents in the operation of licensed aircraft which result in injury to the aircraft shall be reported without delay on the form shown in the "Form Registry".

57. Logs and Navigation Report: The owner or operator of every licensed aircraft shall keep a navigation and engine log book, and shall quarterly transmit to the Secretary of Commerce a navigation summary report, in duplicate, showing the number of hours and the approximate number of miles the aircraft has been flown during the quarter, the duration of the use of each engine, the engine installation and repairs and the plane structure and rigging changes and repairs.

58. Foreign Air Commerce: Until otherwise provided, the laws of the United States and regulations made thereunder with respect to the entry and clearance of vessels engaged in foreign commerce, are hereby made applicable to aircraft engaged in foreign air commerce.

Chapter 4. LICENSING OF PILOTS AND MECHANICS

59. Pilots and Mechanics—Law of: The Secretary of Commerce shall, by regulation—

"Provide for the examination and rating of airmen serving in connection with aircraft of the United States as to their qualifications for such service." (*Sec. 3C*)

"The term 'airman' means any individual (including the person in command and any pilot, mechanic, or member of the crew) who engages in the navigation of aircraft while under way, and any individual who is in charge of the inspection, overhauling, or repairing of aircraft." (*Sec. 9k*)

"It shall be unlawful * * * to serve as an airman in connection with any aircraft registered as an aircraft of the United States * * *without an airman's certificate or in violation of the terms of any such certificate." (*Sec. 11a* 4)

"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of $500." (*Sec. 11b*)

60. Application of the Law: For the purpose of this chapter, persons in command of licensed airplanes in flight will be classed as pilots and persons repairing or adjusting licensed aircraft in flight and persons in charge of the ground inspection, overhauling, or repairing of licensed aircraft, will be classed as mechanics. A workman or mechanic may engage in the repair or overhaul of licensed aircraft without being licensed if such repair or overhaul is in charge of a licensed mechanic.

61. Classification of Pilots and Mechanics: Licensed Pilots are classified as Private Pilots and Commercial Pilots. Commercial Pilots are classified as Transport Pilots and Industrial Pilots. Licensed Mechanics are classified as Engine Mechanics and Airplane Mechanics. A qualified person may hold a plurality of licenses. For example, a person may hold both classes of Mechanics' Licenses or both a Pilot's and Mechanic's license.

62. Limitation of Pilot's Authority:

(A) A Transport Pilot shall not pilot an unlicensed airplane carrying persons or property for hire or reward;

(B) An Industrial Pilot shall not pilot a licensed or unlicensed airplane carrying persons for hire or reward, or an unlicensed airplane carrying property for hire or reward; and

(C) A Private Pilot shall not pilot a licensed or unlicensed airplane carrying persons or property for hire or reward.

63. Applications of Pilots and Mechanics: A Candidate for a Pilot's or Mechanic's license must file an application for the license with the Secretary of Commerce. Blank forms will be sent to the applicant upon his request. He must also appear for physical examination before a physician designated or approved by the Secretary of Commerce.

64. Character, Age, and Citizenship Qualifications: All applicants for pilot's licenses must be of good moral character. The minimum age requirements are 16 years for Private Pilots and 18 years for Industrial and Transport Pilots. Private Pilots may be citizens of any country. Industrial and Transport Pilots must be citizens of the United States or of a foreign country which grants reciprocal commercial piloting privileges to citizens of the United States on equal terms and conditions with citizens of such foreign country.

65. Flying Experience Requirements: An applicant must have at least the following flying experience:

(A) Transport Pilots: One hundred hours of solo flying, of which at least 5 hours must have been within the last preceding 60 days prior to the filing of the application; and

(B) Industrial Pilots: Fifty hours of solo flying, of which at least 5 hours must have been within the last preceding sixty days prior to the filing of the application.

66. Pilot's Physical Qualifications: The physical qualifications for Pilots are as follows:

(A) Private Pilots: Absence of organic disease or defect which would interfere with safe handling of an airplane under the conditions of private flying; visual acuity of at least 20/40 in each eye; less than 20/40 may be accepted if the pilot wears a correction in his goggles and has normal judgment of distance without correction; good judgment of distance; no diplopia in any position; normal visual fields and color vision; no organic disease of eye or internal ear.

(B) Industrial Pilots: Absence of any organic disease or defect which would interfere with the safe handling of an airplane; visual acuity of not less than 20/30 in each eye, although in certain instances less than 20/30 may be accepted if the applicant wears a correction to 20/20 in his goggles and has good judgment of distance without correction; good judgment of distance; no diplopia in any field; normal visual fields and color vision; absence of organic disease of the eye, ear, nose or throat.

(C) Transport Pilots: Good past history; sound pulmonary, cardiovascular, gastro-intestinal, central nervous and genito-urinary systems; freedom from material structural defects or limitations; freedom from disease of the ductless glands; normal central, peripheral and color vision, normal judgment of distance; only slight defects of ocular muscle balance; freedom from ocular disease; absence of obstructive or diseased conditions of the ear, nose and throat; no abnormalities of equilibrium that would interfere with flying.

(D) Waivers: In the case of trained, experienced flyers, the Secretary of Commerce may grant waivers for physical defects, designated as disqualifying by these regulations, when in his opinion the experience of the pilot will compensate for the defect. A waiver once granted will hold indefinitely so long as the defect for which it was granted has not increased, or unless cancelled by the Secretary of Commerce.

67. Exemptions from Physical Examination: Any applicant for a pilot's license or any pilot desiring renewal of his license, who presents a properly certified copy of a Physical Examination for Flying, made in the United States Army, Navy or Marine Corps will be exempt from the physical examination prescribed in these regulations for a period of six months in the case of a Transport Pilot and for one year in the case of Industrial and Private Pilots, *provided*, his physical qualifications, as shown by that physical examination, are not less than those required by these regulations for the class of license for which he applies.

68. Pilots' Examinations and Tests: Unless exempt under these regulations, candidates must pass the following examinations and tests;

(A) *Transport Pilots:*

(1) Examination on the Air Traffic Rules;

(2) Practical and theoretical examination in elementary engine and plane mechanics and rigging and a theoretical examination in the fundamentals of meteorology and air navigation;

(3) Practical flight test as follows: (a) Glide from 1,500 feet and land, in normal landing attitude, by wheels touching ground in front of and within 200 feet of a point designated by the examining officer. The engine shall idle from 1,500 feet but the throttle may be used to clear the engine down to the 500 foot height; (b) Glide from 1,500 feet and land, in normal landing attitude, by wheels touching ground in front of and within 75 feet of a point designated by the examining officer. The free use of the engine is optional. (c) Maneuver of 800 feet around two pylons or buoys 1,500 feet apart, making a series of five

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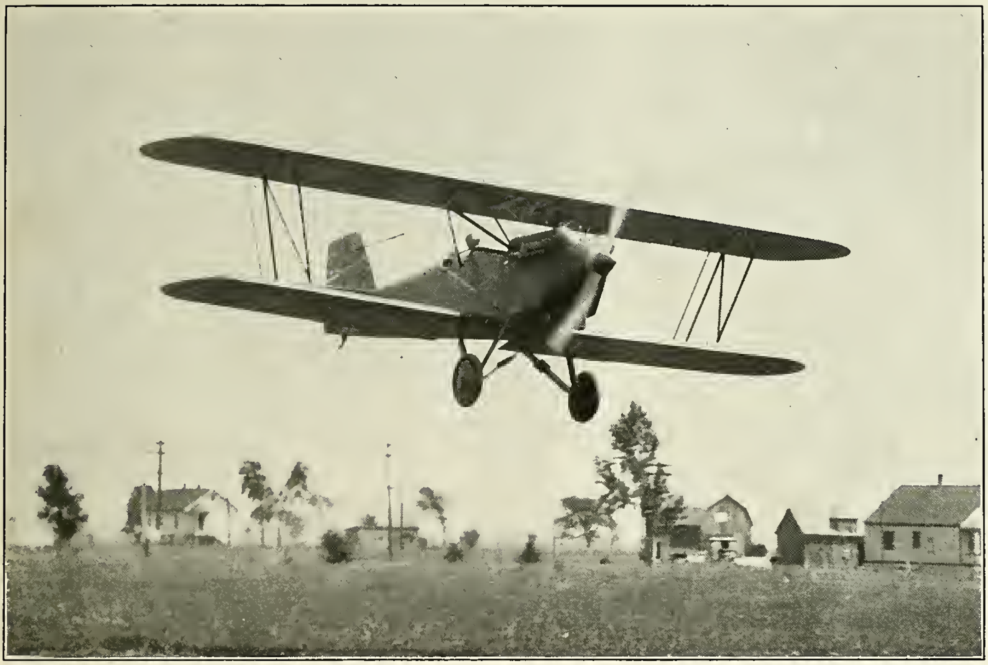

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(*Continued from page* 52)

figure eight turns. (d) Fly over a triangular or rectangular course at least 100 miles, landing at place of take-off within at least five hours. This flight shall also include two obligatory landings, not at point of departure, when craft must come to rest. The course will be designated and the candidate will be furnished with route information by the examining officer at time of departure and the examining officer will determine whether the course was correctly followed and whether the obligatory landings were satisfactory. Upon the presentation of satisfactory proof that the candidate has engaged in solo-cross-country flights a distance of at least 100 miles within one year preceding the date of his application, the flight specified in this subsection will be omitted. (e) Fly in emergency maneuvers, doing spirals, side slips and recovering from stalls;

(B) *Industrial Pilots:*

(1) Examination on the Air Traffic Rules;

(2) The practical flight tests prescribed for Transport Pilots, except the distance for the cross country flight shall be sixty miles.

(C) *Private Pilots:*

(1) Examination on the Air Traffic Rules;

(2) The practical flight test specified in Subparagraph 3c of Section 68A, and three satisfactory landings to a full stop.

Where seaplanes are used in the flight tests specified herein, the landing distance will be fixed by the Secretary of Commerce for each particular seaplane, according to its type and weight.

69. Pilots' Exemptions: Candidates for pilots' licenses who make claim in their applications for and produce satisfactory proof of their right to the following exemptions, will not be required to pass any of the examination specified in Section 68, except the examination on the Air Traffic Rules, and will be licensed as follows, if they possess the requisite physical qualifications:

(a) *As Transport Pilots:* Persons who have had an average of at least five hours of solo flying per month during the six months immediately prior to filing their applications, and who are,

(1) Holders of airplane pilot ratings or certificates in the United States Army Air Corps, who are on active duty status in the regular Army establishment, or,

(2) Holders of Naval Aviators or Naval Aviation Pilots' Certificates in the United States Navy or Marine Corps, who are on active duty status in the regular naval establishment, or,

(3) Persons actively engaged as pilots, for not less than six months, within the year preceding the date of application, in carrying the United States mail for the Post Office Department of the United States, or contractors thereof;

(B) *As Industrial Pilots:*

(1) Holders of Federation Aeronautique Internationale Aviators' Certificates, issued prior to May 20, 1926, provided the holders have had at least 100 hours of solo flying during the year last preceding the filing of their application with the Secretary of Commerce.

(2) The persons mentioned in subparagraph A who have not had the solo flying required therein, but who have had at least ten hours of solo flying in the six months immediately prior to the filing of their application with the Secretary of Commerce;

(C) *As Private Pilots:*

(1) Holders of pilots' ratings in the United States Army, Navy or Marine Corps, including the reserve organizations of such establishments, provided such holders have had at least 50 hours of solo flying since the granting of such ratings.

(2) The persons mentioned in subparagraph B who have had fifty (50) hours of solo flying since the granting of their certificates, or,

(3) Persons who have had fifty (50) hours of piloting of airplanes carrying the United States mails for the United States Post Office Department or a contractor thereof, or

(4) Persons qualified as Transport or Industrial Pilots and who elect to be licensed as Private Pilots only.

All of the exemptions specified in this Section are inapplicable to persons whom the Secretary of Commerce finds have unsatisfactory piloting records, and all of these exemptions shall cease at midnight of December 31, 1927.

70. Place, Etc., of Examinations: Examination for Pilots' licenses will be held at such times and places as the Secretary of Commerce shall designate. Such examinations and tests will be conducted by an examining officer designated by the Secretary of Commerce. Candidates for pilots' licenses must furnish the airplanes in which the flight tests are to be made, unless the Secretary of Commerce makes other provisions therefor.

71. Duration and Renewal of Pilots' Licenses:

(A) Unless sooner revoked, Transport Pilots' licenses shall remain in force for six months and Industrial and Private Pilots' licenses one year from date of issuance.

(B) Licenses will be renewed for like periods where the prescribed physical condition of the holder is shown by the same method as when the original license was issued, except that a Transport Pilot must prove that he has had at least 10 hours of solo flying within the last sixty days, Industrial Pilots at least 25 hours within the last year and Private Pilots at least 10 hours within the last year.

(C) If an applicant for renewal has not had the required solo flying and applies for a renewal within six months after the expiration of his last license, a new license will be issued to him upon proof of his physical qualifications and the passing of the flight tests required for the class of license he last held.

(D) Upon application and for good cause shown a pilot's license may be extended by the Secretary of Commerce for a period of not more than 60 days.

72. Mechanics' Qualifications and Examinations:

(A) An engine mechanic will be licensed upon passing an examination showing that he has sufficient knowledge of internal combustion engines, electricity and power plant of airplane types, and can properly inspect, repair and overhaul airplane engines;

(B) An airplane mechanic will be licensed upon passing an examination showing that he is qualified in plane structure, rigging and control, and can properly inspect, repair and overhaul airplane structures;

(C) The examinations for both classes of licenses will be both theoretical and practical, and the candidate must attain an average of at least 70 per cent. A citizen of any country may be licensed, if found qualified.

73. Duration and Renewal: Mechanics' licenses, unless sooner suspended or revoked, will remain in force for two years after date of issue and will be renewed for additional two year periods upon proof that during the term of the last license the holder has rendered services under his license during at least one-half of the term thereof. Upon application and good cause shown, the Secretary of Commerce may extend the license for a period of not more than sixty days.

74. Suspension or Revocation of Licenses: Pilots' and Mechanics' licenses will be suspended or revoked for:

(1) Violating any provision of the "Air Commerce Act of 1926" or these regulations;

(2) Carelessness or inattention to duty;

(3) Unsound physical condition or any demonstration of incompetency in the operation or repair of aircraft;

(4) Being under the influence, or using, or having personal possession of intoxicating liquor, cocaine, or other habit forming drug, while on duty;

(5) Refusal to exhibit license upon proper demand, or

(6 Violating air traffic rules.

75. Personal Possession of Pilots' Licenses: The Pilot's license shall be kept in his personal possession when he is piloting aircraft and must be presented for inspection upon the demand of any passenger or any authorized official or employee of the Department of Commerce.

76. Pilot's Flight Record: A Licensed Pilot must keep an accurate record of his flying time.

77. Meaning of Solo Flying: As used in these regulations, a person is engaged in solo flying when he is the sole operator of the controls and is in command of aircraft, in flight.

Chapter 5. AIR TRAFFIC RULES

78. Law: "The Secretary of Commerce shall by regulation establish air traffic rules for the navigation, protection, and identification of aircraft including rules as to safe altitudes of flight and rules for the prevention of collisions between vessels and aircraft," (*Air Commerce Act, Sec. 3e*).

79. Application of the Law: "In order to protect and prevent undue burdens upon interstate and foreign air commerce the air traffic rules are to apply whether the aircraft is engaged in commerce or noncommercial, or in foreign, interstate, or intrastate navigation in the United States, and whether or not the aircraft is registered or is navigating in a civil aidway." (*Statement of Managers accompanying Conference Report, Air Commerce Act of* 1926.)

80. Take-Off Rules: The take-off shall not be commenced until there is no risk of collision with landing aircraft and until preceding aircraft are clear of the field.

81. Flying Rules:

(A) *Right Side Traffic:* Aircraft flying in established civil airways, when it is safe and practicable, shall keep to the right side of such airways.

(B) *Giving-way—Order:* Craft shall give way to each other in the following order: 1. Airplanes; 2. Airships; 3. Balloons, fixed or free. An airship, not under control, is classed as a free balloon. Aircraft required to give way shall keep a safe distance, having regard to the circumstances of the case. Three hundred feet will be considered a minimum safe distance.

(C) *Giving way—Duties:* If the circumstances permit, the craft which is required to give way shall avoid crossing ahead of the other. The other craft may maintain its course and speed but no engine-driven craft may pursue its course if it would come within 300 feet of another craft, 300 feet being the minimum distance within which aircraft, other than military aircraft of the United States engaged in military maneuvers and commercial aircraft engaged in local industrial operations, may come within proximity of each other in flight.

(D) *Crossing:* When two engine-driven aircraft are on crossing courses the aircraft which has the other on its right side shall keep out of the way.

(E) *Approaching:* When two engine-driven aircraft are approaching head on or approximately so, and there is risk of collision, each shall alter its course to the right, so that each may pass on the left side of the other. This rule does not apply to cases where aircraft will, if each keeps on its respective course, pass more than 300 feet from each other.

(F) *Overtaking:*

(1) *Definition:* An overtaking aircraft is one approaching another directly from behind or within seventy degrees of that position, and no subsequent alteration of the bearing between the two shall make the overtaking aircraft a crossing aircraft within the meaning of these rules, or relieve it of the duty of keeping clear of the overtaken craft, until it is finally past and clear.

(2) *Presumption:* In case of doubt as to whether it is forward or abaft of such position it should assume that it is an overtaking aircraft and keep out of the way.

(3) *Altering Course:* The overtaking aircraft shall keep out of the way of the overtaken aircraft by altering its own course to the right, and not in the vertical plane.

(G) *Height over congested and other areas:* Exclusive of taking-off and landing, and except as otherwise permitted by Section 86, aircraft shall not be flown:

(1) Over the congested parts of cities, towns or settlements except at a height sufficient to permit of a reasonably safe emergency landing, which in no case shall be less than 1,000 feet; and

(2) Elsewhere at height less than 500 feet, except where indispensable to an industrial flying operation.

(H) *Height over assembly of persons:* No flight under 1,000 feet in height shall be made over any open air assembly of persons, except with the consent of the Secretary of Commerce. Such consent will be granted only for limited operations.

(I) *Aerobatic flying:*

(1) Aerobatic flying means intentional maneuvers not necessary to air navigation;

(2) No person shall acrobatically fly an aircraft:

(a) over a congested area of any city, town or settlement.

(b) without the approval of the Secretary of Commerce, over any open air assembly of persons, or below 2000 feet in height over any established civil airway, or at any height over any certificated airport or landing field or within 1000 feet, horizontally thereof.

(3) No person shall acrobatically fly any airplane carrying passengers for hire or reward.

(J) *Dropping objects:* Nothing which may endanger life or damage property shall be dropped or released from an airplane in flight except when necessary to the personal safety of pilot or passengers. In proper cases, special permission will be granted by the Secretary of Commerce for dropping objects or material from aircraft engaged in industrial operations.

(K) *Seaplanes on water:* Seaplanes on the water shall maneuver according to the laws and regulations of the United States governing the navigation of water-craft, except as otherwise provided herein.

82. Landing Rules:

(A) *Up-wind:* Landings shall be made up-wind, when practicable.

(B) *Course:* If practicable, when within a thousand feet horizontally of the leeward side of the landing field, the airplane shall maintain a direct course toward the landing zone.

(C) *Right over ground planes:* A landing plane has the right of way over planes moving on the ground, or taking off.

(D) *Giving way:* When landing and maneuvering in preparation to land, the airplane at the greater height shall be responsible for avoiding the airplane at the lower height, and shall, as regards landing, observe the rules governing overtaking aircraft.

(E) *Distress landings:* An aircraft in distress shall be given free way in attempting to land.

83. Lights:

(A) *Angular limits:* The angular limits laid down in these rules will be determined as when the aircraft is in a normal flying position.

(B) *Airplane lights:* Between one-half hour after sunset and one-half hour before sunrise, airplanes in flight must show the following lights:

(1) On right side a green light and on left side a red light, showing unbroken light between two vertical planes whose dihedral angle is 110 degrees when measured to the right and left, respectively, from dead ahead and to be visible at least two miles.

(2) At the rear and as far aft as possible, a white light light shining rearward, visible in a dihedral angle of 140 degrees bisected by a vertical plane through the line of flight and visible at least three miles.

(C) *Airship lights:* Between one-half hour after sunset and one-half hour before sunrise, airships shall carry and display the same lights that are prescribed for airplanes, excepting the side lights shall be doubled horizontally in a fore and aft position and the rear light shall be doubled vertically. Lights in a pair shall be at least 7 ft. apart.

(D) *Balloon lights:* A free balloon, between one-half hour after sunset and one-half hour before sunrise, shall display one white light not less than twenty feet below the car, visible for at least two miles. A fixed balloon, or airship shall carry three lights, red, white and red in a vertical line, one over the other, visible at least two miles. The top red light shall be not less than twenty feet below the car and the lights shall be not less than seven nor more than ten feet apart.

(E) *Lights when stationary:*

(1) Between one-half hour after sunset and one-half hour before sunrise, all aircraft which are on the surface of water and not under control or which are moored on anchored in navigation lanes, shall show a white light visible for at least two miles in all directions.

(2) Balloon and airship mooring cables between one-half hour after sunset and one-half hour before sunrise shall show groups of three red lights at intervals of at least every one hundred feet measured from the basket, the first light in the first group to be approximately twenty feet from the lower red balloon light. The object to which the balloon is moored on the ground shall have a similar group of lights to mark its position.

84. Day Marks of Masts, Etc.: By day, balloon and airship mooring cables shall be marked with tubular streamers, not less than eight inches in diameter and seven feet long and marked with alternate bands of white and red, twenty inches in width. The object to which the balloon or airship is moored on the ground shall have the same kind of streamers, which must be in the same position as the lights specified herein.

85. Signals:

(A) *Distress:* The following signals, separately or together, shall, where practicable, be used in case of distress:

(1) The International signal, SOS by radio;

(2) The International code flag signal of distress NC;

(3) A square flag having either above or below it a ball, or anything resmbling a ball;

(4) A succession of white Very's pistol lights fired at short intervals.

(B) *Weather signals:* At certificated lighted airports and fields and at Emergency Fields operated by the Secretary of Commerce, one red fusee, or approved equivalent, is a warning of approach of unfavorable flying weather and two red fusees, or approved equivalents, are a definite signal that the weather conditions make it imperative that aircraft should proceed no farther.

(C) *Signal when compelled to land:* When an aircraft is forced to land at night at a lighted airport, it shall signal its forced landing by firing a red Very's light or making a series of short flashes with its navigation lights, if practicable to do so.

(D) *Fog signals:* In fog, mist, or heavy weather an aircraft on the water in navigation lanes, when its engines are not running, shall signal its presence by a sound device emitting a signal for about 5 seconds in two minute intervals.

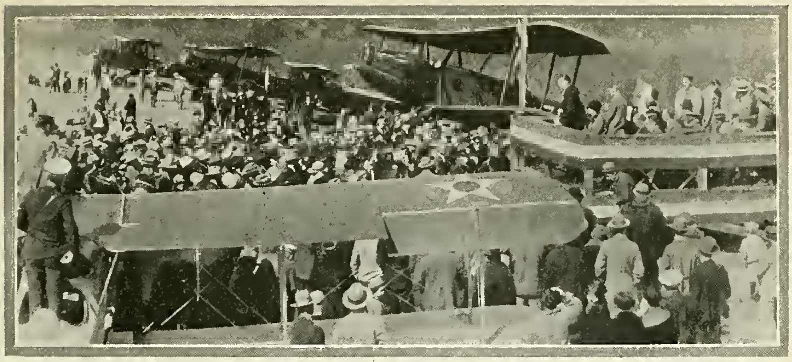
86. Deviation from Air Traffic Rules: The air traffic rules may be deviated from when special circumstances render a departure necessary to avoid danger, or when such departure is required because of stress of weather conditions, or other unavoidable cause.

Chapter 6. MISCELLANEOUS

87. Penalties: The Secretary of Commerce will notify all persons of the incursion of such penalties, and the person charged with the penalty may transmit to the Secretary of Commerce two copies of an affidavit stating the facts upon which the penalty was incurred, with a request for mitigation or remission. The Secretary of Commerce will then determine whether or not the penalty will be mitigated or remitted, and the persons making the request will be notified accordingly.

88. Waiver or Regulations: The Secretary of Commerce may waive any of the requirements of these regulations when in his discretion, the particular facts justify such waiver.

89. Savings Clause: These regulations shall take effect midnight, December 31, 1926. Aircraft and airmen subject to these regulations may continue to operate without a license until July 2, 1927, if the application for the license is filed with the Secretary of Commerce prior to March 1, 1927, and the Secretary of Commerce has not acted thereon.



P & A Photo.

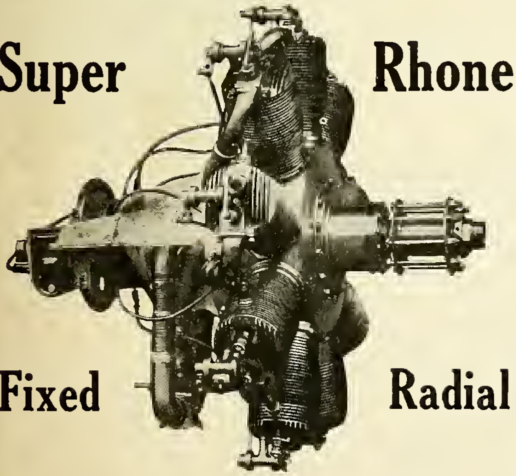
Dedication of the Alvin Callender Airport at New Orleans, Louisiana.

NEW ORLEANS AIRPORT

NEW ORLEANS now has airport, approximately 2100 feet square, with a runway 1500 feet by 300 leading from the field to the Mississippi River. It is located on a shell road about eight miles south of New Orleans. This airport, named Alvin Callender Field, in memory of a native son, one of the heroes of the World War, was dedicated on November 6th in the presence of business and professional men, state officials and distinguished visitors, included among whom were Hon. F. Trubee Davison, Assistant Secretary of War for Aviation; Hon. W. B. MacCracken, Assistant Secretary of Commerce for Aviation; and Brigadier General James F. Fechet, Assistant to the Chief of Air Corps.

Airmen arriving at New Orleans via airplane were Lieuts. Virgil Hine and George Beverly from Brooks Field; Capt. Paul S. Wagner and Lieut. Harvey W. Prosser from Kelly Field; Capt. Joseph H. Davidson and Lieuts. Clarence R. MacIver, Ralph F. Stearley and Arthur L. Bump from Fort Crockett, Texas; Lieuts. Robert D. Knapp, W. B. McCoy, Wm. D. Old and Aubrey Hornsby from Maxwell Field; and from the Naval Air Station at Pensacola, Fla., Commander Warren G. Child, Lieuts. M. E. Crist, C. F. Harper, C. L. Hayden, A. Tucker, B. Rhodes, T. G. Richards, F. W. Roberts, L. N. Medaris and Ensigns Hedding and Hopkins.

Major John N. Reynolds, Commanding Officer of the Fort Sam Houston Airdrome, was the senior officer of the air forces participating in the dedication ceremonies.



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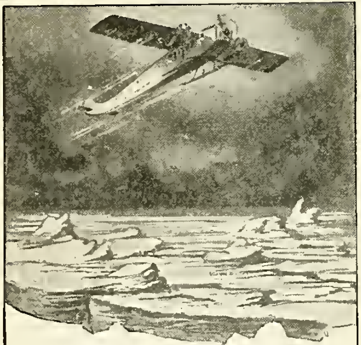


AIRCRAFT PROTECTION

From Fire Now Compulsory

COMMANDER BYRD, in his flight to the Pole, carried Pyrene Fire Extinguishers for protection against fire.

A new regulation of the Department of Commerce demands that all commercial planes be equipped with hand fire extinguishers.

"Fortify for Fire Fighting" by equipping your own aircraft with a Pyrene Fire Extinguisher.

IMPROVED Pyrene TRADE MARK FIRE EXTINGUISHER

KILLS FIRE — SAVES LIFE

PYRENE MANUFACTURING CO., Newark, N. J.

CAUTION: *Use only Pyrene Fire Extinguishing Liquid (patented) with Pyrene Fire Extinguishers*

OFFICIAL WORLD AIR RECORDS

CONFIRMED BY FEDERATION AERONAUTIQUE INTERNATIONALE, OCTOBER 1, 1926

CLASS A—BALLOONS

Grand "Free for All" Record

Duration (Germany)............................87 hrs.
H. Kaulen, Dec. 13-17, 1913.
Distance (Germany)...........3052.7 kil. (1896.9 mi.)
Berliner, Feb. 8-10, 1914.
Altitude (Germany)...............10800 m. (35424 ft.)
Suring and Berson, June 30, 1901.

1st Category (600 *cubic meters*)

Duration (France).....................22 hrs. 34 min.
Georges Cormier, Aug. 10-11, 1924.
Distance (France)...........804.173 kil. (499.69 mi.)
Georges Cormier, July 1, 1922.

2nd Category (601-900 *cubic meters*)

Duration (France).....................23 hrs. 28 min.
Jules Duhois, May 14-15, 1922.
Distance (France).. ....804.173 kil. (499.69 mi.)
Georges Cormier, July 1, 1922.

3rd Category (901-1200 *cubic meters*)

Duration (France)...... ....23 hrs. 28 min.
Jules Dubois, May 14-15, 1922.
Distance (France).......... 804.173 kil. (499.69 mi.)
Georges Cormier, July 1, 1922.

CLASS B—AIRSHIPS

Returning to Point of Departure

Duration (Italy) . ...15 hrs.
Castracane and Castruccio, P-5, June 25, 1913.
Distance (Italy).. .... 810 kil. (503.3 mi.)
Castracane and Castruccio, P-5, July 30, 1913.
Altitude (France)..................3080 m. (10102 ft.)
Cohen, at Conte, June 18, 1912.
Maximum Speed (Italy)....64.8 k.p.h. (40.26 m.p.h.)
Castracane and Castruccio, P-5, July 30, 1913.

CLASS C—AIRPLANES

Returning to Point of Departure Without Refueling

Duration (France)............45 hrs. 11 min. 59 sec.
Drouhin and Landry, Farman biplane, Farman 450 h.p. at Etampes-Chartes, Aug. 7-8-9, 1925.
Distance (France)................4400 kil. (2734 mi.)
Drouhin and Landry, Farman biplane, Farman 450 h.p., at Etampes-Chartes, Aug. 7-8-9, 1925.
Distance—Airline (France).......5174 kil. (3215 mi.)
Challe and Weiser, Breguet 19-A2, Farman 500 h.p., Paris to Bander Abbas, Sept. 17, 1926.
Altitude (France). ....12442 m. (40820 ft.)
Callizo, Bleriot-Spad biplane, Lorraine 450 h.p., Rateau super-charger, at Buc, Aug. 23, 1926.
Maximum Speed (France).....488.171 k.p.h. (278.480 m.p.h)
Warrant Officer Bonnett, Ferbois monoplane, Hispano Suiza 550 h.p., at Istres, France, Dec. 11, 1924.

SPEED FOR SPECIFIED DISTANCES

Speed for 100 kil. (United States).....401.279 k.p.h. (249.342 m.p.h.)
Lt. Cyrus Bettis, U.S.A.C., Curtiss R3C-1, Curtiss V1400, 600 h.p., at Curtiss Field, N. Y., Oct. 12, 1925.
Speed for 500 kil. (France).....306.696 k.p.h. (190.567 m.p.h.)
Sadi-Lecointe, Nieuport-Delage, Hispano-Suiza 500 h.p., at Istres, June 23. 1924.
Speed for 1000 kil. (France)....248.296 k.p.h. (154.283 m.p.h.)
Fernand Lasne, Nieuport-Delage 42C-1, Hispano Suiza 500 h.p., at Villesauvage-La Marmogne, Aug. 29, 1925.
Speed for 2000 kil. (France)....218.759 k.p.h. (135.930 m.p.h.)
Fernand Lasne, Nieuport-Delage 42C-1, Hispano-Suiza 500 h.p., at Villesauvage-LaMarmogne, Sept. 12, 1925.

CLASS C—WITH USEFUL LOAD OF 500 KILOGRAMS (1102.31 lbs.)

Returning to Point of Departure

Duration (Switzerland)... ..14 hrs. 43 min. 29.2 sec.
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 24, 1926.
Distance (Switzerland)..........2301 kil. (1429.7 mi.)
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 24, 1926.
Altitude (United States). ......8578 m. (28143 ft.)
Lt. H. R. Harris, U.S.A.C., U. S. Army TP-1, Liberty 400 h.p., at McCook Field, Dayton, Ohio, May 21, 1924.
Speed for 100 kil. (France).....281.030 k.p.h. (174.622 m.p.h.)
Fernand Lasne, Nieuport-Delage, Hispano-Suiza 500 h.p., at Villesauvage-LaMarmogne, Oct. 7, 1925.
Speed for 500 kil. (France) ...249.618 k.p.h. (155.105 m.p.h.)
Fernand Lasne, Nieuport-Delage 42C-1, Hispano-Suiza 500 h.p., at Villesauvage-LaMarmogne, Oct. 7, 1925.
Speed for 1000 kil. (France)....236.028 k.p.h. (146.660 m.p.h.)
Fernand Lasne, Nieuport-Delage, Type 42, Hispano-Suiza 500 h.p., at Etampes, May 14, 1926.
Speed for 2000 kil. (Switzerland)...... 163.132 k.p.h. (101.365 m.p.h.)
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 24, 1926.

CLASS C—WITH USEFUL LOAD OF 1000 KILOGRAMS (2204.62 lbs.)

Returning to Point of Departure

Duration (Switzerland)........10 hrs. 5 min. 0.8 sec.
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 29, 1926.
Distance (Switzerland)..........1400 kil. (869.9 mi.)
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 29, 1926.
Altitude (France)................6540 m. (21457 ft.)
Lucien Coupet, Breguet Sesquiplane, Type 19, Farman 500 h.p., at Toussus-le-Noble, Mar. 17, 1926.
Speed for 100 kil. (France).....246.440 k.p.h. (153.130 m.p.h.)
Fernand Lasne, Nieuport-Delage, Hispano-Suiza 500 h.p., at Villesauvage-LaMarmogne, Oct. 16, 1925.
Speed for 500 kil. (Switzerland)........163.076 k.p.h. (101.330 m.p.h.)
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 29, 1926.
Speed for 1000 kil. (Switzerland).......161.986 k.p.h. (100.652 m.p.h.)
W. Mittelholzer and G. Zinsmaier, Merkur-Dornier, 6 B.M.W. 460 h.p. ea., at Dubendorf, June 29, 1926.

CLASS C—WITH USEFUL LOAD OF 2000 KILOGRAMS (4409.24 lbs.)

Duration (France)........... 4 hrs. 4 min. 13.2 sec.
Robert Bajac and de Lamothe, Liore and Olivier biplane, Type 21, 2 Jupiter 420 h.p. ea., Sept. 16, 1926.
Distance (France)................500 kil. (310.68 mi.)
Robert Bajac and de Lamothe, Liore and Olivier biplane, Type 21, 2 Jupiter 420 h.p. ea., Sept. 16, 1926.
Altitude (France)............... 4990 m. (16371 ft.)
L. Bossoutrot, super Farman-Goliath, 4 Farman 500 h.p. ea., at Le Bourget, Nov. 12, 1925.
Speed for 100 kil. (France).....150.300 k.p.h. (93.223 m.p.h.)
Robert Bajac and de Lamothe, Liore and Olivier biplane, Type 21, 2 Jupiter 420 h.p. ea., Sept. 16, 1926.
Speed for 500 kil. (France).....147.511 k.p.h. (91.658 m.p.h.)
Robert Bajac and de Lamothe, Liore and Olivier biplane, Type 21, 2 Jupiter 420 h.p. ea., Sept. 16, 1926.

CLASS C—WITH USEFUL LOAD OF 5000 KILOGRAMS (11023 lbs.)

Duration (France)...............1 hr. 12 min. 21 sec.
L. Bossoutrot, super Farman-Goliath, 4 Farman 500 h.p. ea., at Le Bourget, Nov. 16, 1925.
Altitude (France)..................3586 m. (11765 ft.)
L. Bossoutrot, super Farman-Goliath, 4 Farman 500 h.p. ea., at LeBourget, Nov. 16, 1925.

CLASS C—GREATEST PAY LOAD CARRIED TO AN ALTITUDE OF 2000 METERS (6561.7 ft.)

(France)..........................6000 kgs. (13228 lbs.)
L. Bossoutrot, super Farman-Goliath, 4 Farman 500 h.p. ea., at LeBourget, Nov. 16, 1925.

CLASS C—REFUELED IN FLIGHT

Returning to Point of Departure

Duration (United States)...37 hrs. 15 min. 14.8 sec.
Lts. Smith and Richter, U. S. A., DH-4B, Liberty 400 h.p., at Rockwell Field, San Diego, Calif., Aug. 27-28, 1923.
Distance (United States)..... 5300 kil. (3293.26 mi.)
Lts. Smith and Richter, U.S.A., DH-4B, Liberty 400 h.p., at Rockwell Field, San Diego, Calif., Aug. 27-28, 1923.

CLASS C2—SEAPLANES

Returning to Point of Departure Without Refueling

Duration (United States)......28 hr. 35 min. 27 sec.
Lts. C. H. Schildhauer and J. R. Kyle, U.S.N., U.S. Navy PN-9, 2 Packard 500 h.p. ea., at Philadelphia, Pa., May 1-2, 1925.
Distance (United States).......1600 kil. (994.19 mi.)
Lts. F. W. Wead, and J. D. Price, Navy CS-2 seaplane, Wright 585 h.p., at Washington, D. C., July 11-12, 1924.
Distance—Airline (United States).....2963 kil. (1841 statute mi.)
Comdr. John Rodgers, U.S.N., and Lt. Byron Connell, PN-9, 2 Packard 1-A-1500, 500 h.p. ea., San Pablo Bay, Calif. to near Hawaii, Aug. 31-Sept. 1, 1925.
Altitude (France)............. ...8,980 m. (29462 ft.)
Sadi Lecointe, Nieuport Delage, Hispano 300 h.p., at Meulan, Mar. 11, 1924.
Maximum Straightaway Speed (United States)..... 395.439 k.p.h. (245.713 m.p.h.)
Lt. James H. Doolittle, U.S.A.C., Curtiss R3C-2, Curtiss V 1400, 600 h.p., Bay Shore, Baltimore, Md., Oct. 27, 1925.
Since Oct. 1, 1926, the above record has been broken as follows: Maximum Straightaway Speed (Italy)............416.618 k.p.h. (258.873 m.p.h.)
Maj. Mario de Bernardi, Macchi Racer, Fiat A-S 2, 800 h.p., at Ocean View, Norfolk, Va., Nov. 17, 1926. **(Not yet homologated by the F.A.I.)**

SPEED FOR SPECIFIED DISTANCES

Speed for 100 kil. (United States).....377.829 k.p.h. (234.772 m.p.h.)
Lt. James H. Doolittle, U.S.A.C., Curtiss R3C-2, Curtiss V 1400, 600 h.p., Bay Shore, Baltimore, Md., Oct. 26, 1925.
Since Oct. 1, 1926, the above record has been broken as follows: Speed for 100 kil. (Italy)....399.423 k.p.h. (248.198 m.p.h.)
Maj. Mario de Bernardi, Macchi Racer, Fiat A-S2, 800 h.p., at Hampton Roads, Norfolk, Va., Nov. 13, 1926. **(Not yet bomologated by the F.A.I.)**
Speed for 500 kil. (United States).......259.33 k.p.h. (161.14 m.p.h.)
Lt. R. A. Ofstie, U.S.N., Curtiss Navy C-R seaplane, Curtiss D-12, 450 h.p., at Bay Shore, Baltimore, Md., Oct. 25, 1924.
Speed for 1000 kil. (United States).....163.578 k.p.h. (101.642 m.p.h.)
Lts. Victor E. Bertrandias and George C. McDonald, Loening Air Yacht, Liberty 400 h.p., at Hampton Roads, Va., Nov. 7, 1924.

CLASS C 2—WITH USEFUL LOAD OF 500 KILOGRAMS (1102.31 lbs.)

Returning to Point of Departure

Duration (United States).....7 hrs. 35 min. 54 sec.
Lt. H. E. Halland, U.S.N., F5L flying boat, 2 Liberty 400 h.p. ea., at San Diego, Calif., June 6, 1923.
Distance (United States)..........750 kil. (466 mi.)
Lt. H. E. Halland, U.S.N., F5L flying boat, 2 Liberty 400 h.p. ea., at San Diego, Calif. June 6, 1923.
Altitude (France).................5475 m. (17962 ft.)
M. Darque, Shreck, F.B.A., Type 21, Lorraine 450 h.p., Sept. 15, 1926.
Speed for 100 kil. (France).............203.275 k.p.h. (126.309 m.p.h.)
Lt. Demongeot, Villiers seaplane, Type 4-2, Lorraine 450 h.p., at St. Raphael, May 13, 1926.
Speed for 500 kil. (Denmark)..........180.234 k.p.h. (112.053 m.p.h.)
M. Landman, Rohrbach seaplane, at Kastrup, Aug. 28, 1926.

CLASS C 2—WITH USEFUL LOAD OF 1000 KILOGRAMS (2204.62 lbs.)

Returning to Point of Departure

Duration (United States)......5 hrs. 28 min. 43 sec.
Lt. Geo. R. Henderson, U.S.N., PN7-1 flying boat, 2 Wright T-2, 535 h.p. ea., at Bay Shore, Baltimore, Md., Oct. 25, 1924.
Distance (Denmark)..........519.830 kil. (311.20 mi.)
M. Landman, Rohrbach seaplane, at Kastrup, Aug. 28, 1926.
Altitude (France)..................4053 m. (13297 ft.)
M. Paumier, Schreck, F.B.A. seaplane, Hispano-Suiza 500 h.p., at Argentenil, Dec. 5, 1925.
Speed for 100 kil. (Denmark)..........185.471 k.p.h. (115.246 m.p.h.)
M. Landman, Rohrbach seaplane, at Kastrup, Aug. 28, 1926.
Speed for 500 kil. (Denmark)...........180.234 k.p.h. (112.053 m.p.h.)
M. Landman, Rohrbach seaplane, at Kastrup, Aug. 28, 1926.

CLASS C 2—WITH USEFUL LOAD OF 2000 KILOGRAMS (4409.24 lbs.)

Returning to Point of Departure

Duration (United States).....1 hr. 49 min. 11.9 sec.
Lt. O. B. Hardison, U.S.N., PN7-2 flying boat, 2 Wright T-2, 535 h.p. ea., at Bay Shore, Baltimore, Md., Oct. 25, 1924.
Distance (Italy)...............253.69 kil. (157.63 mi.)
Guido Guidi, Dornier-Wal "Idaor", 2 Rolls-Royce 260 h.p. ea., at Pisa, Feb. 3, 1925.
Altitude (Italy)....... ....3006 m. (9862 ft.)
Guido Guidi, Dornier-Wal "Idaor", 2 Rolls-Royce 260 h.p. ea., at Pisa, Feb. 3, 1925.
Speed for 100 kil. (Italy)..............134.514 k.p.h. (83.582 m.p.h.)
Guido Guidi, Dornier-Wal "Idaor", 2 Rolls-Royce 260 h.p. ea., at Pisa, Feb. 3, 1925.

CLASS C 2 (Seaplanes) GREATEST PAY LOAD CARRIED TO AN ALTITUDE OF 2000 METERS (6561.7 feet)

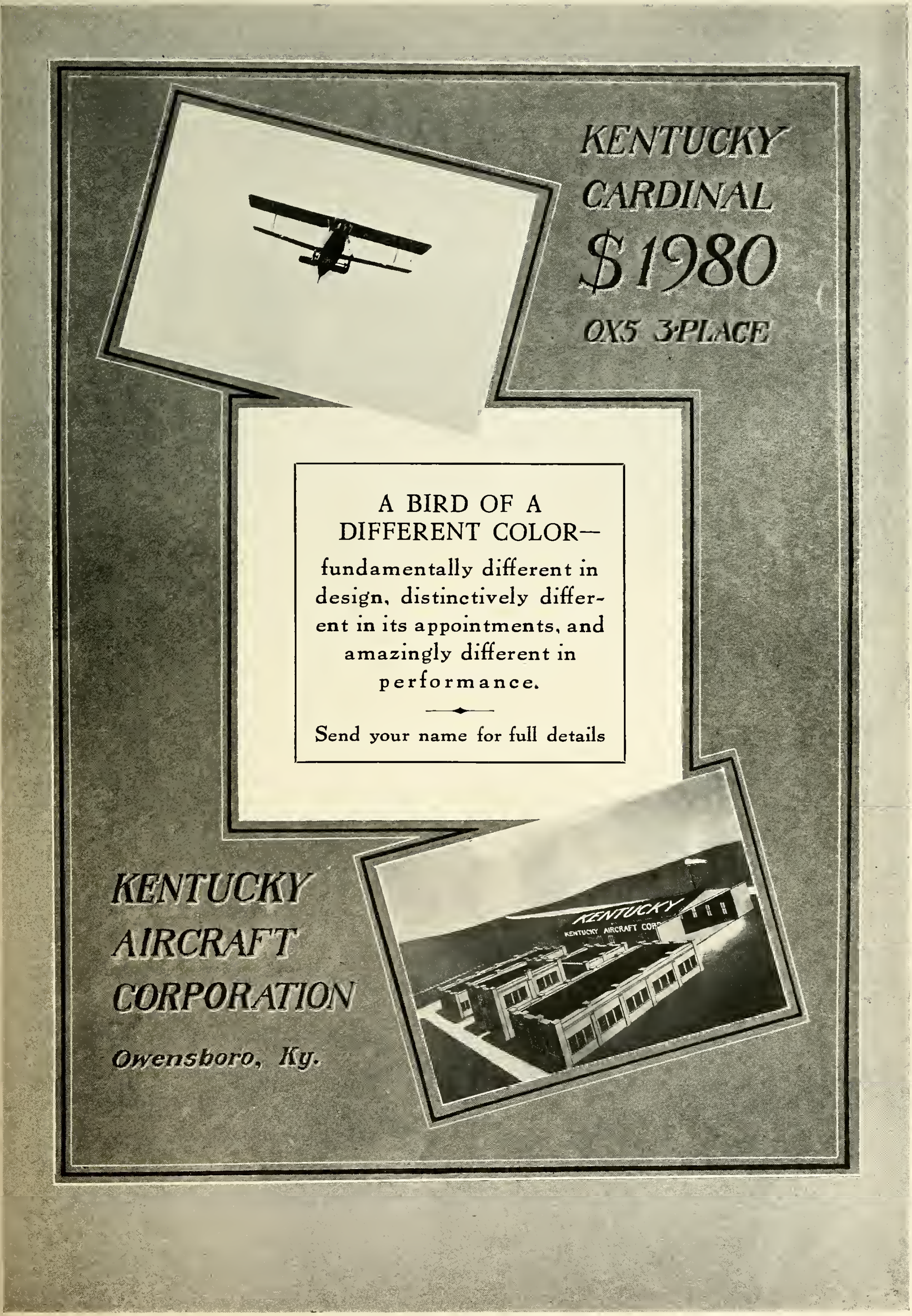
(Italy).. ....2000 kgs. (4409 lbs.)
Guido Guidi, Dornier-Wal "Idaor", 2 Rolls-Royce 260 h.p. ea., at Pisa, Feb. 4, 1925.

CLASS D—GLIDERS

Duration (France)..........10 hrs. 19 min. 43.4 sec.
Comm'dt. Massaux, Poncelet Vivette Glider, at Vauville, July 26, 1925.
Distance—Airline (France)........8100 m. (26568 ft.)
Lt. Thoret, Bardin Glider, at Vauville, France, Aug. 26, 1923.
Altitude (France)...................545 m. (1788 ft.)
E. Descamps, DeWoitine Glider, at Biskra, Feb. 7, 1923.

CLASS G—HELICOPTERS

Distance—Airline (France)..........736 m. (2414 ft.)
Pescara, Pescara Helicopter, 2 propellers, Hispano-Suiza 180 h.p., at Issy-les-Moulineaux, April 18, 1924.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FOREIGN AERONAUTICAL NEWS IN BRIEF

FRANCE

THE Tenth Annual Air Salon opened at the Grand Palace, Paris, on December 3. Dozens of airplanes, ranging in size from the 40 horse-power Caudron to the super-giant two-engined Farman bombing plane with a lifting power of 14,000 pounds, gave ample evidence of France's advance in aeronautical development. So big is the Farman bomber that considerable difficulty was experienced in taking it into the building, even in sections. Its maximum speed is 190 kilometers an hour and it can attain a height of 6,500 meters. Besides carrying six large bombs, two machine guns are mounted fore and aft.

A COMPETITION to increase safety in airplane operation is being conducted by the "Union pour la securite en Aeroplane", Paris. The chief items in the competition are as follows: Apparatus to signal the beginning of fires; apparatus to extinguish fires employing only non-dangerous products; apparatus permitting landing in foggy or misty weather; light motors operating on heavy oil; and apparatus permitting use of a detachable cabin furnished with a parachute.

THE International Commission of Air Navigation held its 11th session in Paris during November, 1926, with 22 nations represented. The United States, which had unofficial observers at previous meetings of the commission, was not represented this year. Among important decisions taken were the following: Action regulating the procedure of technical inquiries into accidents occuring to aircraft in foreign countries; simplifying the international model of the "carnet de route" (traveling permit) for aircraft; completing requirements to be met by candidates for navigators' licenses; preparing, for the projected Washington radio-telegraph conference of 1927, an outline of proposals relative to the use of wireless in air navigation. The 12th session of the Commission will be held in April, 1927, at Lisbon or London.

THE first of the huge flying boats, on which work was begun nearly three years ago, has been completed in the yards of the Societe Anonyme des Ateliers et Chantiers de Penhoet at St. Nazaire. The preliminary trials of the machine are reported as having been very satisfactory. It flew for several hours at an average speed of about 200 kilometers per hour. It is said to be the largest flying boat in the world.

The monoplane wing is 5 feet 10 inches thick. The hull is 85 feet 10 inches long, 13 feet 3 inches wide and 10 feet 9 inches deep. Five 420 h.p. Jupiter engines are used.

This boat was constructed for service between France and the African coast, across the Mediterranean Sea. Two pilots, a navigator and one mechanic comprise the crew.

General specifications of the Richard-Penhoet flying boat:

Wing span	131 feet 2 inches
Wing chord (maximum)	29 feet 6 inches
Wing chord (minimum)	16 feet 5 inches
Total wing area	2,889 square feet
Wing section	Eiffel 391
Weight unloaded	25,300 pounds
Weight loaded	38,500 pounds
Useful load	13,200 pounds
Stabilizer area	354 square feet
Elevator area	117 square feet
Fin area	42 square feet
Rudder area	74 square feet
Power loading (per h.p.)	18.3 pounds
Wing loading (per square foot)	13.3 pounds
Fuel capacity (8 tanks)	880 gallons
Range of action	7 hours

AIR traffic at Le Bourget (Paris for the months of June, July, August and September, 1926, was as follows:

Departures and arrivals—June, 1,260; July, 1,575; August, 1,539; September, 891. Passengers—June, 4,165; July, 6,047; August, 5,774; September, 3,171. Express matter—June, 155½ tons; July, 185¼ tons; August, 128 tons; September, 126 tons. Mail —June, 1,871 kgrs.; July, 1,792 kgrs.; August, 1,758 kgrs.; September, 1,850 kgrs.

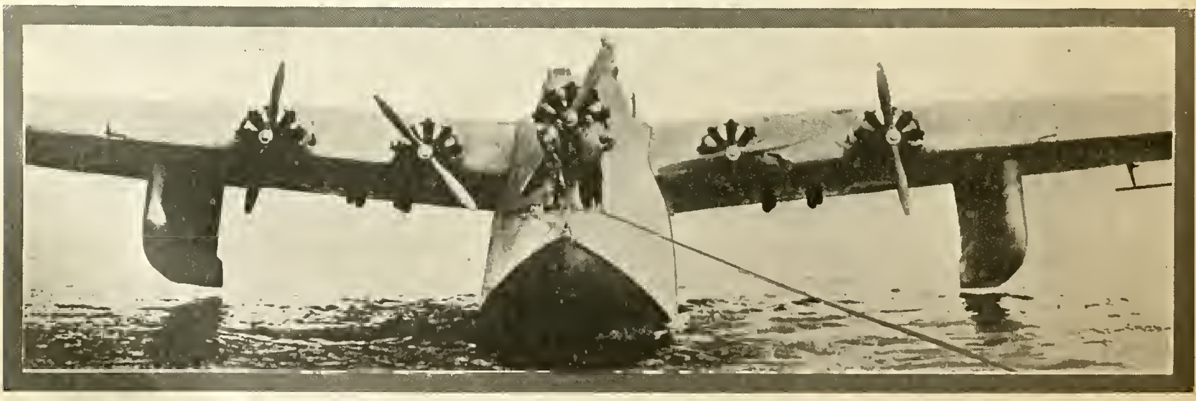
GERMANY

GERMAN civil aviation during the five-month summer season April-August, 1926 show that planes of the Lufthansa covered 4,000,000 kilometers and carried 56,331 passengers, 409 metric tons of baggage and 434 metric tons of postal matter plus freight during that period. The highest daily mileage flown by the Lufthansa planes during this period was 37,141 kilometers as against 35,174 in 1925.

IT IS reported that the Zeppelins to be built at Friedrichshafen for the proposed Spain-South America airline will use a newly discovered gas fuel. The ships will have six motors, have 105,000 cubic meters content, a length of 235 meters (771 feet) and a diameter of 30.5 meters (100 feet). The gondola will contain twenty-four single staterooms and a salon.

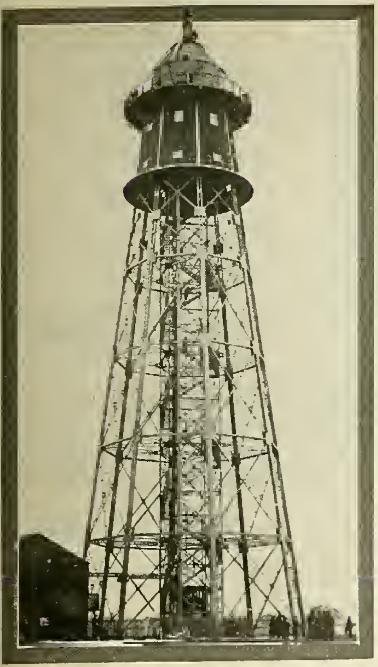
NEGOTIATIONS for air service between Berlin and Madrid, via Basel, are now under way. It is proposed to start the new service with the beginning of the 1927 flying season. Departures will take place daily from Amsterdam, Hamburg, Berlin, Prague, and Vienna, to Basel, Zurich, Geneva, Lyon, Marseilles, Barcelona, and Madrid. There will be daily service in both directions. From Marseilles to Barcelona a night service will be operated.

GERMANY'S winter aviation schedule is to amount to about 45 per cent of her summer network. 16,000 kilometers are to be flown daily as against 39,000 during the summer season. Within this total are included the following lines: Berlin-Hannover-Amsterdam-London; Berlin-Hamburg-Copenhagen-Malmo; Malmo-Copenhagen-Hamburg-Bremen-Amsterdam-London; Berlin-Danzig-Koenigsberg (night); Berlin-Breslau-Gleiwitz; Hamburg - Hannover - Frankfort-Mannheim; Berlin - Hannover - Essen; Berlin-Braunschweig-Essen; Berlin - Halle-Cologne; Berlin - Halle - Erfurt-Frankfurt; Berlin-Leipzig - Fuerth - Nuremberg - Stuttgart; Berlin - Leipzig - Fuerth - Nuremberg-Munich; Munich-Vienna-Budapest.



P. & A. Photo.

The world's largest flying boat—the 5-engined French Richard-Penhoet, capable of carrying a useful load of 13,200 pounds.



Herbert Photo.

New mooring mast at Cardington, England, built for the giant dirigible, R101.

ENGLAND

THE Dominion Premiers attending the recent Imperial Conference inspected the Royal Aircraft Works at Cardington and saw work in progress in connection with the Government plans for an airship service between England and India, with a subsequent extension to Australia and New Zealand.

First they ascended the new type of mooring mast, of which three are to be provided, one in England, one in Egypt, and a third at Karachi in India. The mast is a steel tower 200 feet high, with an elevator inside to take passengers to a platform on the summit, from which they will enter the nose of the airship through a covered gangway.

The enlarged airship shed—815 feet long and 170 feet high and claimed to be the biggest building in the British Empire—was also visited.

Newspaper correspondents were not permitted to obtain more than a distant view of a completed section of the new 5,000,000 cubic foot gas capacity airship, the R101, which is to be finished by 1928. The method employed in constructing and assembling the new stainless steel girders has been closely guarded.

Outstanding features of the great airship are: length, 720 ft.; diameter, 120 ft.; lift, 150 tons; capacity 5,000,000 cu. ft.; 7 crude oil engines, 600 h. p. each (total 4200 h. p.); passengers, 100. It is designed to fly 4,000 miles at 63 miles an hour. Sleeping cabins will be provided with two or four berths. There will a promenade deck, lounges and smoking rooms. On the upper of the two internal decks will be a dining room seating 50 people at a time, which will be reached by an elevator from the lower deck.

THE De Havilland "Hercules" (photographs and description of which are on page 40 of this issue) which is to open the new Imperial Airways route from Egypt to India is scheduled to leave England on January 1. The plane will fly from Croydon to Cairo, and will open the service from that point on January 12 by a flight over the desert to Bagdad and across the Persian Gulf to Karachi in northern India. Sir Samuel Hoare, Secretary of State for Air, accompanied by his wife, Lady Maude Hoare, and members of his staff, will be passengers on the inaugural flight.

For the first three months after that date, machines will leave Cairo for Basra, Persia, at fortnightly intervals, arrangements being made to connect in Egypt with mail steamers from England. On April 6, when experience has been gained in operating the route, the last section from Basra to Karachi will be opened commercially, making a through route of just over 2,500 miles.

The fare from Cairo to Karachi will be £72; from Cairo to Bagdad £41; from Cairo to Basra, £51; from Bagdad to Karachi, £37; from Basra to Karachi, £30; and from Bagdad to Basra, £9. The fare includes not only transport but quarters at night and meals throughout the journey.

Passengers embark at Heliopolis airdrome, Cairo, on Wednesday afternoon, reach Bagdad early Thursday afternoon, and, when the full route is open, will arrive at Karachi Saturday afternoon. The time spent on the complete journey is a little more than three days, but the actual flying time is only 31 hours 45 minutes eastbound and 30 hours 35 minutes westbound. Rest houses have been provided at all stages where accommodation does not exist, and these will be staffed by Imperial Airways to provide quick meal service during the day and comfortable sleeping quarters at night.

The headquarters and main workshops will be at Cairo. When the entire route is in operation, five machines will be in service, their schedule being planned so that there will always be a spare machine at either end of the desert section ready for emergency use, so that every machine after eight weeks, or approximately 86 hours' flying, will return to Cairo for thorough inspection and overhauling. Over the desert route, the ground organization provides, apart from six refueling stations, a landing ground approximately every 25 miles.

SPAIN

THE Hispano-American Aviation Congress, which was held recently in Madrid, Spain, was attended by the Ambassadors of Portugal and all the Latin American countries and by special delegates from Argentina and Uruguay.

During the congress consideration was given, among other things, to a study of a customs and transportation agreement between the Spanish and Latin American countries, which would eliminate unnecessary customs formalities and facilitate the reciprocal interchange of aeronautic equipment and the supply of raw materials to be utilized in this industry. A preliminary discussion was made relative to the formation of an Ibero-American aeronautic agreement which would provide for complete liberty of contracts and agreements between Spain and the Latin American republics.

It was urged that the Spanish aeronautic industry is sufficient, not only to provide for the needs of the country, but also sufficient for contracts to be taken for the supply of aeronautic equipment to the other countries.

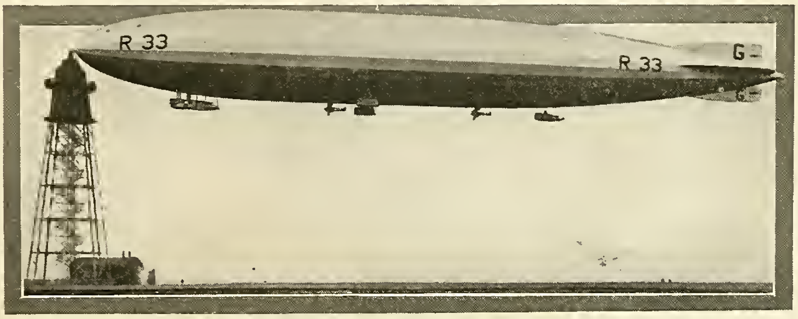
Resolutions were taken approving commercial treaties between Spain and Latin American countries, in which special favored nation treatment would be accorded to Portugal, the Latin American republics and the Moroccan zone.

PROPOSED economies in the Spanish army will reduce the cavalry, infantry and all troops except aviation. The air forces will be increased with a view to assembling, if possible, two thousand planes of different classes.

A COMMISSION for an airship (Zeppelin) line is reported to have been granted by the Government of Spain to a Spanish-German concern, the Compania Transaera, for air traffic between Seville and Buenos Aires.

The first airship to be put in operation is to be built at Friedrichshafen. This craft should be ready for use in the fall of 1927 or the spring of 1928.

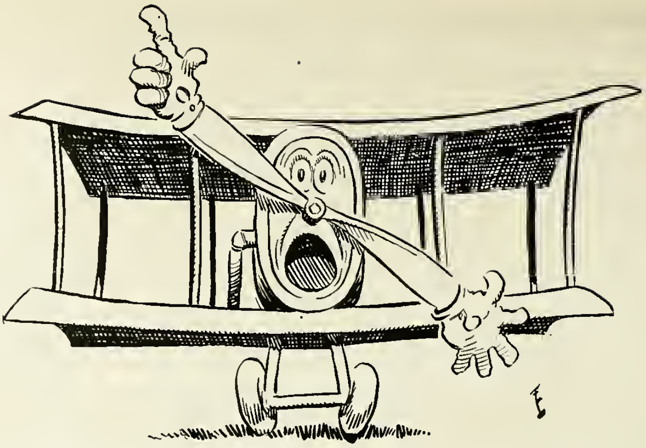
The Spanish Government is reported to have guaranteed a subsidy of 6,000,000 pesetas a year for five years, as soon as operations commence. With a provisional schedule of 12 round trips per season, this means a gift of 500,000 pesetas per trip.



Underwood & Underwood.

The R33, carrying two fighting planes, attached to England's new mooring mast.

PICKED From The AIR



AERO DIGEST will award a prize of $5 each month for the best humorous contribution published. Only those pertaining to the aircraft field will be considered. Address the "Picked From The Air" Department, Aero Digest, 220 West 42nd Street, New York, N. Y.

Kenneth D. Stern, St. Louis, Missouri, won the prize for January.

Future Alibis

THE TIME—*Spring, 1950.* THE PLACE—*Anywhere up, U. S. A.* SCENE—*Moonlight, soft breezes, whispers, and two lovers in a racy cloudster.*

With a loud Brrraaaaaa-aaaaaaa-aaaaaaa an air cop from the misty heights in a pursuit patrol swoops down upon the speeding lovers and throttles down alongside them:

"Say! wassamatter 'th yuh? Pull up alongside the next cloud! Doncherknow yuh can't make no left turns 'round that bloon back there? Itchin' t'get set down 30 days, are yuh?"

"But officer,"—remonstrates the pilot.

"Officer me nuthin', young feller. Tell it to the Judge."

"But officer"—and the sweet young blonde in a poke bonnet (ladies kindly note style change) pokes her head over the edge of the cockpit—

"We were only diving after a falling star that we thought came off your uniform."

MRS. FEITELBAUM GREDUALLY GETS DE DOPE ON DIS AVIASHUN BIZZYNESS

(With apologies to Milt Gross)

SCENE: *An appotament houze.*

Second Floor—Good monnink, Mrs. Feitelbaum! Deed you got sopprize maybe wot we are beck alraddy in de flet?

First Floor—Iy yi yi yi!! Beck again from your weckeshan yat? I tut wot you'll gonna spand de holl hottom wit weenter.

Second Floor—Hm—dunt esk! Whan iss coming de snow wit hice wit skeed chens wit fruzzen raddiaters is a good time you should get beck to de helevator appotament wit nize stim hitt.

First Floor—Is so? Wot was de nem of de citeh wot you wisited?

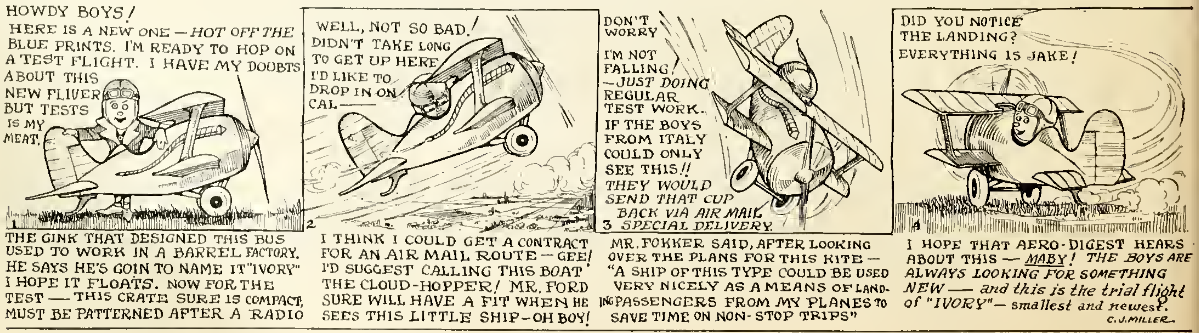
Second Floor—Is by de nem Detten—

First Floor—Iy yi yi yi!! Is dot a place? Dey gotta sue itch odder in de cuts yat wit proving de antzesters aint monkehs wit tchimpanzees.

Second Floor—Wait!—Is not de sem place. Diss Detten is from de stet Hohio, de jam citeh with boitplace from de hairoplane yat.

First Floor—So, how did dey borned de hairoplane?

Second Floor—Hm!—a quastion!! It sims a foim of new beginners colled de Wright Bros. got de heydea from reading a hotticle is called Spid Weengs in de Tzaturdeh Ewening Pust. So right away, Mrs. Feitelbaum, dey are going out to McCook fild dey should fly in de hair a hairoplane. So they are gredually coming in de fild and a hofficer yall out "Hult! You got maybe a hoperations horder wit flying ratting wit helt soitificate? If not, bitt it or you gat maybe a doity nut from de hatchitent." So de Wright boys sad to dis hofficer (Hm—was he a beeg goorelleh) "Wats de rizzon we cant fly in de hair a hairoplane?" So de hofficer sad, "Houtsite plizz. Axcept maybe wot you got peppers with megezene hotticles from blad cuddling axperiences wot you had it wit floiting wit det it should show in bleck wit wite yat sotch a hace you was." So de Wright boys replite, "Phooy for you wit hoperations horders from Jennehs wit Woughts. If we gotta write yat in de megezenes hotticles, we gonna build it our own sheep it should be a plasure to creck op." So, Mrs. Feitelbaum, is how de foist hairoplane was built wot de Wright boys colled from de nem "Kitteh Hock." (*Cont. on p. 65*)


HOWDY BOYS! HERE IS A NEW ONE—HOT OFF THE BLUE PRINTS. I'M READY TO HOP ON A TEST FLIGHT. I HAVE MY DOUBTS ABOUT THIS NEW FLIVER BUT TESTS IS MY MEAT.
1
THE GINK THAT DESIGNED THIS BUS USED TO WORK IN A BARREL FACTORY. HE SAYS HE'S GOIN TO NAME IT "IVORY" I HOPE IT FLOATS. NOW FOR THE TEST—THIS CRATE SURE IS COMPACT, MUST BE PATTERNED AFTER A RADIO
WELL, NOT SO BAD! DIDN'T TAKE LONG TO GET UP HERE I'D LIKE TO DROP IN ON CAL——
2
I THINK I COULD GET A CONTRACT FOR AN AIR MAIL ROUTE—GEE! I'D SUGGEST CALLING THIS BOAT THE CLOUD-HOPPER! MR. FORD SURE WILL HAVE A FIT WHEN HE SEES THIS LITTLE SHIP—OH BOY!
DON'T WORRY I'M NOT FALLING!—JUST DOING REGULAR TEST WORK. IF THE BOYS FROM ITALY COULD ONLY SEE THIS!! THEY WOULD SEND THAT CUP BACK VIA AIR MAIL SPECIAL DELIVERY.
3
MR. FOKKER SAID, AFTER LOOKING OVER THE PLANS FOR THIS KITE—"A SHIP OF THIS TYPE COULD BE USED VERY NICELY AS A MEANS OF LANDING PASSENGERS FROM MY PLANES TO SAVE TIME ON NON-STOP TRIPS"
DID YOU NOTICE THE LANDING? EVERYTHING IS JAKE!
4
I HOPE THAT AERO-DIGEST HEARS ABOUT THIS—MABY! THE BOYS ARE ALWAYS LOOKING FOR SOMETHING NEW—and this is the trial flight of "IVORY"—smallest and newest.
C. J. MILLER

AERO DIGEST

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WHILE AMERICA SLEEPS

(Continued from page 8)

The planes circled over the city, dropping gas bombs in every part and on the fortifications and naval base. Anti-aircraft batteries engaged the invaders hotly, but utterly without effect, as the planes spread out over the whole city offering only individual targets for the gunners. The batteries were silenced after not more than five minutes, the crews overcome by gas, against which their masks were no protection. The enemy planes circled at their leisure, unopposed, dropping bombs at intervals for thirty minutes, selecting their targets with care, and departing northward when they had dropped their loads. Whether they landed in the islands or whether they returned to aircraft carriers is not known.

The scenes of suffering and horror in Manila are beyond description. The helpless inhabitants rushed frantically about in a vain effort to dodge the deadly rain of gas and to escape from the city. For the majority escape was impossible. They rushed along the streets to the outskirts, only to meet a cloud of gas. Turning back they would encounter another burst. Those driving cars were no more fortunate. Drivers were overcome at the wheel and collapsed, their cars plowing wildly through masses of people until they crashed against poles or buildings, pinning men, women and children under the wreckage.

The terrible loss of life in Manila was due to the presence in the city of practically all of the inhabitants, for few had given credence to the message from the fleet. Even when the planes appeared, few imagined that their errand was war. And it was not until the bombs came hurtling down with their loads of stinging, burning, strangling death that the true meaning of the invasion was apparent. Then stark panic gripped the people as they ran blindly, in abject terror, until they inhaled the gas and fell, writhing in the death agony.

Those who breathed the gas near where the bombs had burst died instantly. Those who inhaled it greatly diluted with air ran screaming until they dropped, their flesh blistering and sloughing off in patches. The gas attacked and destroyed the lung tissues, causing death by strangulation. Over a thousand children are dead in and around the American High School. Not until the planes were dropping their bombs were the children marched from the building, only to meet the poisonous fumes. Those coming out struggled to reënter the building, causing a jam from which few escaped. To-day those citizens who are alive, assisted by Asiatic soldiers, are removing and identifying the mass of dead children. Here, at this school of death, is focused the misery of Manila. Parents, most of them badly burned, many of them dying, are gathered here, some almost crazed with grief, others standing in dry-eyed desolation, as the bodies are disentangled from the packed mass and laid out in ever-lengthening rows.

Yesterday the efforts of the survivors and the soldiers were directed to relieving the injured. To-day the work is with the dead. In this warm climate it is impossible that bodies be kept until coffins can be constructed. The dead number too many. Therefore, as a sanitary measure, and by order of the Asiatic authorities, the dead are being buried in common graves, fifty bodies to a grave. Where possible, identification is made and carefully recorded, but as whole families and whole neighborhoods have been wiped out this is not always possible. No more than 200 children killed in the High School have been identified.

The city is quiet. There are no clashes between the citizens and the occupying Asiatic forces. Even the hatred

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U. S. Navy, Fleece Sheep lined, hookless fasteners, reduced from $35 to $25.

Some of the above suits which have water spots are still further reduced.

** These suits actually cost the Navy $250 apiece and are brand new.*

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of the invader that might be expected, has not shown itself. The general horror and misery seem to have obliterated every other feeling. Parents whose children have been killed work side by side with enemy soldiers, themselves affected by the appalling scenes of death. Many of the soldiers are no more than boys, and seem stunned at the terrible destruction of life accomplished by their airmen.

In the capture of Manila as in the capture of the American Fleet, Asiatic naval vessels took no part. Only after the inhabitants had been killed or injured by gas did an Asiatic Fleet arrive and land troops. In both cases the invading fleet was used only for transport.

The cables to Hongkong, to Shanghai and to Guam were put out of commission at 9 a. m. December 14, proving that Asiatic vessels had dredged up the cables and cut them. At noon to-day all three cables were again in operation, the vessels probably standing by until they received orders to restore communication. During the whole of December 14 Asiatic jamming stations were at work, cutting off any messages that might have been sent from the islands, until such time as the invaders could take over control of the shore stations.

WASHINGTON, Dec. 16, 1930.—(*Special to* AERO DIGEST.) The loss of the Philippines and the capture of the American Asiatic Fleet by air forces of the Imperial Asiatic Republic has completely stunned Washington official circles. Such an eventuality had never been considered. The capture of a country and a battle fleet by aircraft alone had been deemed absolutely impossible by the best-informed naval and military authorities. Those who believed that they knew the potentialities of aircraft, and had pointed out the possibility of this form of warfare, had been dismissed as visionaries. While naval authorities were in favor of the use of airplanes as the eyes of the fleet and as bombers and torpedo carriers, they had not considered it possible that aircraft, unsupported by surface vessels, could defeat a battle fleet. The realization that they have done so has left naval and military officials practically helpless to cope with the situation.

The Secretary of the Navy and the Secretary of War are in conference with the Bureau of Navigation and the General Staff. It is said that the Pacific Fleet will be despatched to the war zone, accompanied by the aircraft carriers *Wright* and *Langley,* and the tenders *Sandpiper* and *Teal,* all at present at Hampton Roads. But the mobilization of these naval aircraft units and their despatch to the Pacific to join the fleet will take some time. And when the fleet arrives in the war zone, will it be any more effective than was the ill-fated Asiatic Fleet? This is the question that everyone is asking.

The Chemical Warfare Section of the Army is practically where it was when the war ended in 1918, and has available no gas such as that used by the Asiatic Forces. The Chemical Section has not been in favor with the higher authorities of the Army and Navy, who have been reluctant, perhaps for humanitarian motives, to experiment further with more deadly gases, forgetting that an enemy might not be so humanitarian.

The sad and terrible fact now obtrudes itself that the United States has been depending for protection upon obsolete weapons, or upon weapons that are obsolete without the help of aircraft and chemicals. It appears now that while aircraft would not be able to fly across the Pacific and destroy an enemy without the aid of a fleet of aircraft carriers to convey them that distance, neither would

(*Continued on page 64*)

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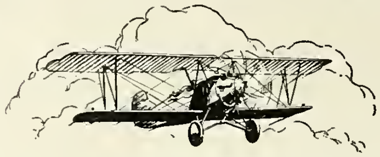

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1927 copy Curtiss OX5 engine manual describing care, maintenance and overhaul. Price 25 cents, postage prepaid anywhere in the U. S. *NOW ready for mailing.*

NICHOLAS-BEAZLEY AIRPLANE CO.
266 W. North Street
MARSHALL, MISSOURI

(*Continued from page 63*)

the fleet of battleships, cruisers, and destroyers be of any value whatever without adequate airplane protection, or without proper protection against gas.

Senator North states: "The underlying mistake that is responsible for this terrible loss of American life, prestige, and property, lies in the inability of the stereotyped naval and military mind to realize that anything can ever be any different to whatever it may happen to be at the moment. Any advances in methods of warfare have been received always with scepticism, if not with actual abuse of the people advocating them. Then, too, there is the natural refusal of the human mind to accept as a possible truth any unpleasant fact until it is actually demonstrated. General Lord Roberts, of England, pointed out the menace of the late German Empire, and forecast its war of aggression. He was laughed at and maligned as a fomenter of dissention between two peaceful nations. Yet Lord Roberts lived to see the German armies invade France. Political economists who have studied the population expansion of the Asiatic Republic have pointed out that the increase must go somewhere—and why not to the Philippines? No one heeded them. They were crazy alarmists. Men who knew not only the present powers of aircraft and gas, but also could sense their potentialities, and who gave voice to their ideas, were laughed at as insane dreamers by people who forgot that every invention, every progression of human knowledge, has come from the mind of a dreamer."

To-night the Secretary of the Navy and the Secretary of War will make their report to the President, who, it is rumored, has invited General William Mitchell to attend the conference.

WASHINGTON (11 P. M.), Dec. 16, 1930.—(*Special to* AERO DIGEST.) The Imperial Asiatic Government has formally notified the American Ambassador that a state of war exists between the Imperial Asiatic Republic and the United States, but that the Asiatic Government is prepared to discuss terms of peace. The note concludes: "The Imperial Asiatic Government considers the Philippine incident closed in its entirety. Any discussion of peace terms will refer only to the complete cessation of American influence in the Pacific, including not only the withdrawal of naval and military units, but also the cessation and evacuation, or transfer to Asiatic control, of all commercial activities."

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Sizes up to 16'-0" x 6'-4"

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PICKED FROM THE AIR

(*Continued from page 60*)

First Floor—From ket boids yat I sappuz!!!

Second Floor—Hm! Deed it fly like a boid—like a heagle yat. So is one day de Wright boys gredually flying arond de keppitle from Wushingtan wit zums wit lups wit all kints immleheim toin overs, so de janeral steff luked op from stodding "De kempenns from de tzivil wur" and sad, "Hordeleh, pull don de blinds; is going on houtzide monkeh biziness to de prajudice from good horder wit military ditzipline and besites is no such hennimal." So de hordeleh pulled don de blinds and put houtzide de dur a sign—"No kenwessers wit buk hedgents wit hayviaters should deestoib de wurr colitch when is going on clesses from teery of hindian fighting." And so de Wright boys flew gredually pest de Neveh Dippotament where is hedmirals witt buttswens wit all kinds gubs. So de hedmiral gafe one luke de hairoplane wots surring in de wicinity of de Hetlentic flitt, so's queek colling on de talefun de keptin from de sheeps. So he sad in de talefun, "Halo, halo, is dat you, keptin? You better queek wind up de stobbed wottch and geradehere in cass is dropping out from dis hairoplane monkeh ranches wit spock plugs yat it should maybe dimmolish a couple dradnuts."

First Floor—Iy yi yi yi!!!

Second Floor—Hm—dunt esk! So gredually is stepping on de pupp deck by de hedmiral a young neveh hayviater from muddest expression and he sad, "If is by you Hoh Keh, chiff, I have inwented a ressing sheep it should easy as lock rulling mek fife wit seex miles a minutes maybee more yat, so's gonna meck a bom out from de hommy." So de chiff sad, "Go had, keed, but dunt nottify nobody axcepting de nusspeppers so's saving opp beeg sopprice for my dear frand Janeral Meetchell." So, Mrs. Feitelbaum, is building dot neveh fellah a resing hairoplane wit altimetters for de foist time yat wit anchen trobble for weening sacond price with all kinds hendeh dewices shall ravulsionize spid trevel in de hair.

First Floor—Iy yi yi! And deed he wined all de resses wit models wit stoiling silfer cops wit beeg rur appluz from de hommy?

Second Floor—Hm—Dunt esk!! Wit soch a mashin he dont got to be by de judges on spicking toims even soch a expoit he is.

First Floor—So wats de nem from dis mashin wot he colled it???

Second Floor—Is by de mashin de nem Cronna Underwood, de leetle switthott from de gubs.

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to Government specifications
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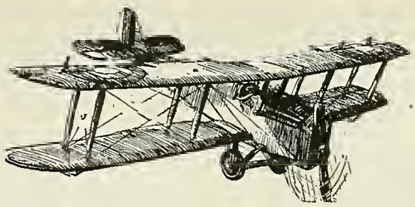

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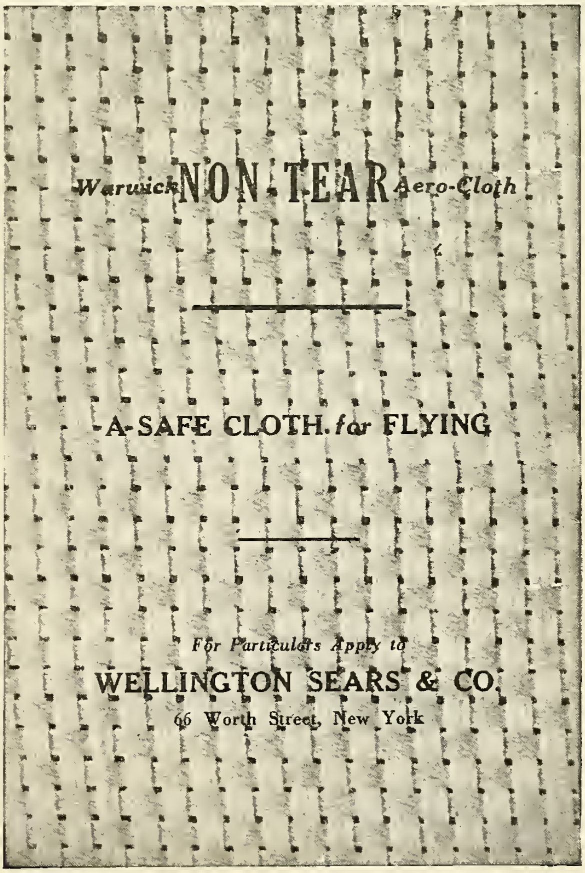

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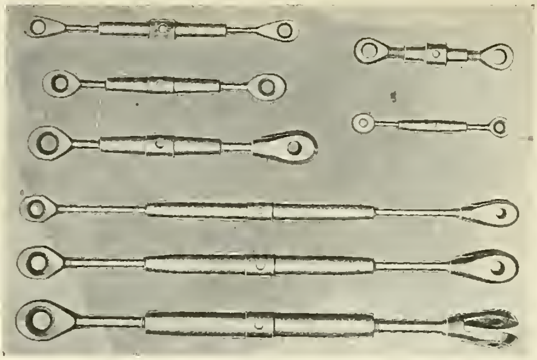

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A BABY CREEPS, BEFORE IT WALKS, and before a person attempts to fly, he or she should have a thorough knowledge of the fundamentals of aviation.

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The course covers EARLY HISTORY OF AVIATION—GLIDING—THE WRIGHT BROTHERS AND EARLY AVIATION IN AMERICA— TYPES PAST AND PRESENT—BALLOONS AND DIRIGIBLES—TYPES AND DIVISIONS OF TYPES—COMMERCIAL FLYING—FUNDAMENTALS OF THE SCIENCE OF FLIGHT—RELATIVE MOTION—NEWTON'S LAWS OF MOTION—NATURAL STABILITY—CENTER OF PRESSURE AND CENTER OF GRAVITY.

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THE AMERICAN SOCIETY FOR PROMOTION OF AVIATION
522 Fifth Ave., New York City

A NOD AND A WINK

(Continued from page 17)

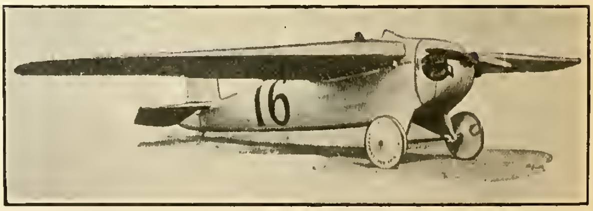
sweetness and modesty of the American Expedition. "I cannot tell a lie," says Byrd. "I must give a lot of credit to Floyd and the crew of the *Chantier.*" And Bennett says, "Boys, I want to tell you that Dickie deserves a lot of credit for what he did." This note of modesty was such an original touch in an Arctic expedition that all the hearers turned to each other and cried, "What manner of men are these? They must be from the tropics."

One thing that Nobile discovered was that a bunch of ordinary American Democrats and Republicans will pay a lot more to hear a Pole lecture than will a crowd of Fascisti. That may be why he stayed over here after the big show closed. It's just possible.

THE Coué act, "Day by Day in Every Way, We're Growing Weaker and Weaker," starring the National Aeronarcotic Association, was received with great enthusiasm, two boys in the gallery and an old lady in a box applauding vigorously, until thrown out for creating an unseemly disturbance during a sad act. The star part was played by a Miss Crabbit, a spinster from Boston, now retired to private life. The scene opens with her asking her little nephew if he would like to be president when he grows up. "I'd sooner be right than be president," replies the noble lad. "Well, you're all wrong," says the good old lady, laying aside her knitting and reading eighteen pages of a report on the doings of the N. A. A. for the year. "All wrong all the time," she goes on, "so you're just the man for president of the N. A. A. Land knows I've had enough of it." "I'd sooner be one of the Assistant Secretaries for Aeronautics," says the kid. "You ain't got no pull," replies the old lady, who was a graduate of Wellesley and very popular in the Boston City Club. "I tried for it myself and never got nowhere but left."

Then in comes a bunch herded along by an old admiral who nipped their heels every now and then. They brought to the convention a whole lot of new delegates with "Bought and Paid For" written on them. "Remember," growls the Admiral, "only dead ones must be elected. We don't want this N. A. A. to grow so big it will have any power." "Right, your Majesty," says the delegates, and proceed to carry out his instructions by electing to the presidency one whose past performances guarantee that no further progress will be made. The scene closes with a bunch who had come there trying to elect a man to the job walking hurriedly away and giving a fairly accurate imitation of Napoleon on the retreat from Moscow.

HEATH "TOMBOY" $500.00



WINNER OF AERO DIGEST CUP
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THE spread of Communism in the United States was deftly handled in that scene, "Dividing The Records," in which Uncle Sam is seen handing most of his air records to the foreigners. There were tears of gratitude in Mussolini's eyes when the Navy said, "Here, Mussy, it ain't right we should have all the money and all the records, too. So we're going to give you our seaplane record. Add it to the National Debt and here's a nice shiny Schneider Cup to keep the lot in. God bless you!" There wasn't a dry eye in the place—nor a dry man. The cry, "Here's how!" and, "Well, here's looking at you!" resounded on all sides as the Americans at Norfolk drowned their sorrow in the Musticellar Hotel. This scene would have received more publicity only the boys staged the race at a time when all our efforts were devoted to following the Hall-Mills business, which, of course, pushed a little thing like a vanished air record away back in the paper among the steamship ads. Hardly anyone knows it's gone.

But we've won the record for kind-heartedness, and have just had a cable from Lenin congratulating us on our generosity and our conversion to Communism. He asked us if we wouldn't help Russia by giving them part of our Naval Air Service. But we wired back that we needed both planes.

However, we should worry about the Navy. So long as Al Williams doesn't get disgusted and move some place else we've still got a chance of getting back a few records. Keep your eye on that big blonde. One of these days he's going to pry himself loose from his typewriter and get on his Speed Wings and snatch back a flock of records that Uncle Sam gave away when he was in that Communistic mood. Al's a capitalist, you know, since he got to writing for the *Saturday Evening Post*. I'm still a Socialist, writing for this publication. Once I used to write for an obscure trade paper in the aviation line, and then I was a right down Communist. They couldn't have divided property in any manner so I wouldn't have won. That was when I was working as test pilot for the MacNickel Airplane Co., whose president, Mr. MacNickel, still has the first one he ever earned. He was born in Scotland and spends his winters in Palestine, collecting boat patents from the natives.

THE Ford Tour scene went fairly well, but encountered a lot of opposition from Chevrolet dealers. They had a crazy idea in their heads that it was a Ford Motor Co. publicity stunt, and therefore did all they could to keep any reference to this scene out of the gnuspapers. They were pretty successful, too. No one in the east had any idea the scene was on until Brice Goldsborough wandered in and said he had copped first prize for leading Walter Beech around in a Travel Air tied to a Pioneer

(*Continued on page 68*)

Novel Free Gift for Aero Fans

We present a complete series of facsimiles of "The British Gazette" to every new annual subscriber to "The Aero Field." "The British Gazette," the only daily newspaper issued by the British Government, appeared for eight days only during the great general strike and all editions were largely distributed by aeroplanes. It is an unique souvenir, commemorating the value of aviation during an epoch-making crisis.

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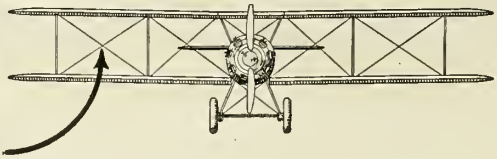

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Hartshorn EST. 1860 Streamline Tie Rods

STEWART HARTSHORN CO., 250 Fifth Ave., New York

(*Continued from page 67*)

Instrument Co. direction-finder. That fellow Brice is the original homing pigeon. You just take him out of a box, chuck him straight up in an airplane, and say "Go find it!" And he flaps his wings, circles about the direction-finder, sniffs the earth inductor compass, rubs himself against the turn-indicator, and makes a bee-line for the home coop.

These two comedians, Beech and Goldsborough, were featured in the same old act in which Tony Fokker played to capacity houses last year. Excellent comedy relief was furnished by the late Shorty Schroeder in the three-engined Ford, in a little turn called "Motorizing the Farm," the idea being to drop one of the three motors on one farm, and the plane itself on the next farm, both of which stunts Shorty pulled off perfectly, receiving hearty applause.

Leroy Manning, one of the newer comedians, a debutante in comedy, as it were, put over an exquisitely funny bit in the Ford single-engined plane at Fort Wayne. He taxied out and stuck in the mud until all the other boys had gone. The more he buzzed the motor the deeper sank the Ford. "A horse! A horse!" he cried. "My kingdom for a horse!" Shakespeare, who happened to be standing nearby, got half a laugh at this and has used the quotation ever since. The rest of the laugh was mailed to Detroit, where it was greatly enjoyed. But it was all good genial publicity for le bon Monsieur Henri. You know, it's got so now that four out of five have pyorrhea, and the other one has a Ford.

ONE of the outstanding events of the Follies was the chariot race from Ben Hur. Jim Ray, the sleepy comedian from Philadelphia, took the part of Ben Hur, while Casey Jones, the well known comic from Garden City, played Messala. This Messala was the champion chariot racer of the whole Roman Empire. If he stepped in a chariot and yelled, "Giddap!" or "E Pluribus Unum!" or whatever it was an ancient Roman used to say to a nag when he wanted it to start, why, that nag would gather its feet up under it, hump its back, and romp up the home stretch several lengths ahead of the following horse. The general opinion was that this old Roman, Messala, couldn't be beaten—except with a club.

Well, Casey Jones took over the part of Messala in modern air life. Whenever he got into a race the people just sat back making bets on who would be second. And Jim Ray took over the part of Ben Hur, a lad who had always attended Sunday school and stayed in nights. So you see what a dramatic contrast we have right there. Well, the chariot race was staged at Philadelphia during the Suckercentennial. There were old Casey Jones Messala and Ben Hur Ray tearing around for all they were worth, which was about $6 each immediately before the race. Nobody thought that Ben Hur had a chance. Everyone had his money on Casey Messala, as usual. Then as the racers went around, it began to dawn upon us that Ben Hur was creeping up on Messala. Of course us Hebrews just went wild. "Oi, yoi, yoi!" yelled Moe Pitcairn to me. "Is dis a bizness!" "Dunt esk!" I cried. "Watch it de race already, Moe." And such excitements, Mr. Yiffniff, when dot boy Bennie Hur comes it home foist, Mr. Yiffniff, leaving Casey Messala behindt yet.

THE Snore song from Lowenwet sung by Howard Wehrle and the Philadelphia Sextette was the most popular drinking song in the Follies. When the clown band struck up that number, to the tune of Horses, which certainly were needed to pull the airplanes out of the mud, everybody walked out to get a drink, and hid in the Bellevue-Soakford Hotel until this act was off the boards. During the song they staged a travesty on the National Air Races, featuring Dainty Dollie Deficit, as usual. No matter who seems to be going strong at the beginning of the act, Miss Deficit always romps in at the end and walks off with any honor there may have been. She is the one performer we may always count on to be right there at the finish. Some new producer of the Follies may change the act and leave her out, but it would be a shame, for we've grown so used to seeing her. After the first part of the Air Race act is over, we usually look at each other and say, "Isn't Miss Deficit working this year?" And then someone points her out over by the reserved seats, waiting her turn.

Scenery for this act was designed by the Wehrle Burial Vault Co., furniture by the Church Pew Co., properties by the Philadelphia Undertaking Parlors, costumes by the Ludington Shroud Co., and hangars by The Open-Air Hangar Co., Unlimited. Wines by Wacker.

OF course, no revue would be complete without a couple of good sea scenes, with a bunch of jolly tars knocking the tar out of something. In the first of these scenes, the Navy tars are in their office in White-washington, trying to knock the tar out of the long-distance seaplane record. "What can we do to snatch a little publicity for the Navy?" barks Admiral Mulligatawny—he was an old sea-dog who had lost most of his teeth. "Let's send the PN-10s to Colon," replies someone with a sense of humor. "Colon! What's the Navy got to do with punctuation, question-mark?" asks the Admiral who was a droll dog himself in his off moments. "I would like to know, comma, what you mean, period." "That's the name of a place, Admiral," says an officer in the Intelligence Corps. (He was the youngest of a family of six and his people hadn't known what to do with him.) "I was only joking.

exclamation point!" laughs the good old Admiral, playfully throwing a copy of AERO DIGEST out of the window. "But why send these two Naval Aircraft Factory planes to Colon? That's all we've got to show for the millions spent at our factory this year, and if we lost them, what the devil would we do?" "If anyone found them, they'd return them," says the Intelligence officer, "besides, we must do something with airplanes and make the public think we're using them. They've kind of lost confidence in the battleships." "The wretches!" exclaims the Admiral, hurling a copy of the Lampert report at the office cat.

The next scene shows the PNs starting off, accompanied by the whole Atlantic squadron, the firemen piling coal on in the mad race for Colon. However, they needn't have hurried, for both planes are seen descending half way there at a place called Semi-colon, somewhere out in the middle of the Caribbean Sea. The battleships toot their whistles to call back the reporters who have been waiting in Colon for a long period to write up the flight, question mark? The curtain descends upon this scene amid a tense silence, broken only by the sound of a Marmon sedan starting up, off-stage.

THE next sea-scene depicting the triumph of airplanes over old Neptune's domain was equally enjoyable. The scene is laid at the entrance to New York Harbor, and shows the liner *Dyspeptic* coming to port carrying Sir Alan Cobham, a welcome addition to the line of brewery and munitions knights created by King George to prove that his country is going democratic. Sir Alan is right up at the bow sitting on an anchor, and peering ahead to see if he can make out the figures of his American lecture tour manager and press agent on the pier. He can't, of course, because both are frantically running around the gnuspaper offices trying to convince the city editors that an English commercial traveler arriving with an old airplane and a new title is news. Just as Sir Alan says "What ho! Where are the bally blightahs?" they get the editors convinced. and the papers come out with big headlines, "King's favorite bird alights today?"

Meanwhile the crew of the *Dyspeptic* are slinging overside a small plane called a DH Moth, wearing rubber boots so it feels at home in the water. Sir Alan and Lady Cobham are lowered into it and start off to fly ahead of the *Dyspeptic* to New York—this, of course, being an advertising stunt along the best American lines, which proves either that Sir Alan is quick to grasp our methods or else that his manager has lived here some time, I don't know which. Well, anyhow, the band strikes up and the Moth flutters around frantically on the water, trying to get up and fly. But the rubber boots are too much for it. There it goes, back and forth, forth and back, like a water beetle, with never a sign of getting out of the sea. Finally Sir Alan decides that the plane is carrying too much weight, so he taxies up to the *Dyspeptic*, a derrick is lowered, and the Lady is lifted from the Moth to the deck of a launch, and a man takes her place in the plane. Still no go, however. The poor old Moth flutters madly about but sticks to the water. No sooner does it get up speed than it sticks its nose into a wave, slows up, and the band stops playing.

Finally Sir Alan gets aboard the launch which tows the Moth along, far behind the *Dyspeptic*, which arrives, in its slow but sure way, two hours ahead of the Moth. The welcoming committee, composed of every New Yorker who wanted to get his picture in the papers, had gone down the bay in another launch, complete with press photographers and typewriters. Now it dashes up and finds Sir Alan, slightly damp, and with his Moth on the end of a towline, staring up at the Liberty Memorial Statue and wondering what it's there for. To slow, sad music the curtain falls, leaving Sir Alan still struggling with the problem.

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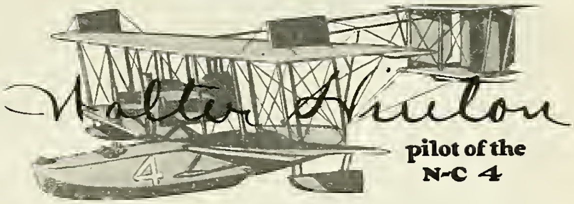

A great industrial development in air transport has begun in the United States. The good places will go to young men with the necessary knowledge and training, and the recent Government ruling states that pilots, airplane inspectors, riggers and mechanics must qualify by examination for these high salary positions.

These young men will be the aircraft engineers and executives, the operating officers and pilots who, during the next few years, will contribute to America's Air Supremacy.

A thorough knowledge of planes, aircraft engines, construction, instruments, and why an airplane flies.

This knowledge is now available in easily understood form in the thorough and comprehensive

Spare Time Study Course
of the
AVIATORS PREPARATORY INSTITUTE
Walter Hinton, President

AND now the Grand Finale. To roll of drum and crash of cymbal the curtain rises. Outlined against a radiant background of splendid accomplishment, stand those men whose courage, whose invention, whose high endeavor, have staged for America her most spectacular production. They stand together and watch the curtain of the old year as slowly it descends and shuts them from our view.

The Follies of 1926 are over.

◆

AND then—the lights grow dim, the music of the orchestra is hushed, the laughter and the talking stop, as the curtain of memory is slowly raised, disclosing a stage set as though for some noble pageant, and hung with brilliant tapestry. Woven of the purple threads of courage, the golden threads of romance, and the crimson threads of high adventure, there it hangs, a fitting background for those who take their place before it. Actors, these, in the stirring drama of aviation; men who have played their parts and played them nobly, and who now would say good-bye. Pilots of the Army, of the Navy, of the Air Mail, of Commercial Aviation, pilots who hear no longer the roar of motors, nor feel the rush of driven air—there they stand, those men we knew so well and will not meet again. But see! They smile across the void to us and raise their hands in greeting—and farewell! The light grows brighter, brighter, almost dazzling in its radiance; the swelling sound of music floods the air; and on those actors who have played the drama of the sky, who knew its tragedy, its comedy, there falls at last the final curtain.

LEARN to FLY

You Fly by Flying.

THE SWEENEY SYSTEM *of* *Practical Airplane Mechanics*

The Sweeney System first prepares a student by intensive practical work on motors, building, recovering wings, rigging and all details of construction, repairing and handling. This is called ground school work. To show you the quality of the men who teach you, look at Spencer and Wimer for instance. Spencer was an army pilot and has been teaching and doing commercial flying since 1917. Wimer is a college man, went overseas, was with the 1st Air Park as an observer, spent over 200 hours in the air and since the war has been with two big aircraft corporations.

Learn to Fly!

Aviation is no longer a mystery—no longer a hazard; no, it is a business, growing greater and more important; you can qualify as a mechanic, engineer, repair man, builder or a pilot.

opens up a world of opportunities for young men. The **Sweeney System** has no planes to sell, and sticks strictly to teaching both ground work and pilotage. Sweeney Airport is one of the best and safest fields in the U. S. All the resources of this **Million Dollar School** insure you the best, most practical instruction. Mechanics earn $50 to $150 a week. Flyers, up to $500.

The Sweeney System

is divided into two parts. **First:** You are thoroughly taught in the ground school. This fits you as an aviation mechanic. You can build your own plane and do anything required in aviation mechanics and construction and repairing when you have finished this work. You are thoroughly taught motors, etc., and work with thousands of dollars worth of new material, and all types of engines.

Secondly: After completing this work if you want to be a pilot you take ten hours of flying. Now when you understand that two to seven hours is all the average man needs to learn expert flying you will appreciate what ten hours in the air under skilled men will do for you.

On the ground 5 men are needed for one in the air, but if you want to become a pilot you easily master the work and can go into postal, government, or commercial work. Flyers are in demand, earning big money at fairs taking up passengers, etc. $5 for a 10 minute flight is pretty fine pay!

Send Name Today

for full details of this aviation mechanical course and photographs of planes and equipment actually used; also full information as to the commercial end of flying and opportunities for young men.

LEARN TO FLY BY FLYING
Sweeney
SCHOOL of AVIATION
3305 SWEENEY BLDG, KANSAS CITY, MO.

HAIL 1927—GOOD-BYE 1926

(*Continued from page 13*)

and comfortable navigation of the air.

A Fine Sporting Spirit

Again, in an aside, we must recognize too that materiel in this line was no more striking than personnel. Having traveled about a thousand miles with the Tourists, I can testify that what they were doing, on that 2,600-mile jaunt, was no more striking than the spirit in which it was done. Half a hundred pilots, mechanics and passengers enjoyed a comradeship of the "all for one and one for all" sort, glad of each other's achievements, sorry when one was out of luck on any particular leg of the trip, all generous in their good wishes for the others, none who was not too big to have taken a mean advantage of another. In short, the Tour is doing as much to iron out rivalries and jealousies from the ranks of the flyers and builders of aircraft as it is in searching out the weak points of engines and planes and pointing the way to better things.

What we say for the Tour goes for the National Air Races at Philadelphia, where planes being built for the Army and Navy made a similar showing of steady improvement.

And to clinch the argument, the year's sales of aircraft over the country—out here in the prairie country we have been buying lots of them—and the busy factories that are planning for expansion and record output for 1927, tell the story of substantial gains for the year just closed.

The New Air Mail Lines

Of passenger air lines we may not have many, but the Stinsons being flown down in Florida, the Fokkers farther up the coast on the Philadelphia-Washington-Norfolk line, the Los Angeles-Salt Lake line and others, show the way we are headed; while the annual report of Postmaster General New shows eleven contract air mail lines in actual operation, the first getting going February 15, 1926, and their total mileage flown to the close of the fiscal year being 378,478 miles.

All of them are flying, not all are making profits, but there will be more of them every year until most of the mail is transported by air.

It will be more nearly an Airway System, too, when that Transcontinental line, operated so well by the government for several years, is let out to private contractors, if it is let, as it should be, with the requirement that passenger and express business be developed as soon as possible, as well as the carrying of the mails. There will be a lot of regret that the government is to get out of the business of flying the mail planes, but with that policy determined upon, it will be expected that passenger and express carrying, which the government could not attempt, will soon develop out of the new order.

Last, But Not Least—

Then there are the three new Assistant Secretaries—Davison in the War Department, Warner for the Navy, and MacCracken for Commerce. When Congress authorized their appointment it builded better than it knew, we may believe; for every one of them knows the game not only of flying but of coöperation to the end that we shall be better equipped for it and do a lot of it.

No one who has been in Washington recently and seen how they are organizing for their work can doubt that we started something this year which will help the rapid development of our aerial arms of defense and of commercial aviation, now giving more concrete evidence of getting under way than ever before.

So, Good-bye, 1926; you did your stuff, and we are all set for bigger and better performance in the air.

All Hail, 1927—we see you coming, clear and high on the horizon, with wings on!

COMMERCIAL SUPERCHARGERS

(*Continued from page 20*)

power of airplane engines has been increasing geared engines have been developed in large sizes with excellent results. The knowledge obtained with these engines can be readily applied to the smaller supercharged engine. Practically no power is lost through a well designed gear drive, and the current practice of placing a flexible spring coupling between the crankshaft and the reduction gear makes a durable and smooth drive, and helps to damp out the crankshaft vibration.

The development of the positive type supercharger brings up renewed interest in the two cycle engine, for it is now possible to do away with crankcase compression and use direct forced induction. The accompanying illustration shows the simplicity of an air-cooled engine of this type. A three cylinder engine is suitable for low powers, and has about the same torque characteristics as the six cylinder four-cycle engine. The maximum amount of supercharging is determined by the design of the supercharger and its capacity per engine revolution in relation to the displacement of the engine. For example, if the supercharger will deliver twice as much air as the engine would ordinarily suck in at each revolution, the pressure will be more than doubled, the final pressure being effected by the temperature rise, which in turn is a function of the supercharger efficiency and the amount of radiation. By providing an overlap between the opening of the intake valve and the closing of the exhaust valve (in two cycle engines with a distributing valve) practically all the residual charge can be scavanged by the incoming gas delivered under pressure. This will give an undiluted and cleaner burning charge in addition to a greater weight and volume of fresh mixture. A crankcase compression is unnecessary, the design of the crankcase may be similar to that used in four cycle engines, and pressure lubrication used, making possible a reduction in the overall length, and the weight of the crankcase.

Superchargers have so thoroughly demonstrated their value for military aviation that all new engines for the Air Corps must be arranged to use without alteration one of the several types of superchargers that have been standardized by the experimental station at McCook Field. Several companies have already taken advantage of the greater normal power that may be obtained with a supercharged engine, and have constructed the supercharger as a part of the engine itself. Perhaps the first engine of this type is the nine cylinder air-cooled Curtiss radial engine, which has a built-in centrifugal supercharger compressing the mixture from a single carburetor, and delivering it through radial outlets to the various cylinders. The air-cooled Liberty engine, a recent McCook Field development, has a low altitude supercharger directly connected to the crankshaft, while an inverted engine of the same type has a supercharged induction system that will not only increase the ground power of the engine, but will keep this power constant up to an altitude of over 15,000 feet.

Though it is still too early to predict the final effect of the supercharger on commercial airplane engines, this much is reasonably certain: the power will be increased at least 30 per cent for the same weight and displacement, the period between overhauls will be lengthened, and the engine will be particularly easy to adjust and keep in perfect operating condition.

Forced landings are dangerous and expensive.

They may often be avoided by checking motor temperatures which give warning in ample time to make a safe landing.

BOYCE MOTO METER

mounted on the instrument board shows at a glance the approaching danger of motor failure.

The MOTO METER CO., Inc.
Industrial Thermometer Division
LONG ISLAND CITY, N. Y.

AIR—HOT AND OTHERWISE

(*Continued from page 10*)

paid for the two PN-10s that flopped on their flight to Colon. They were Philadelphia built. It would be no less fascinating to get accurate, not departmentally doctored, information as to the actual cost of the aviatory dud, that sad PN-9, which ingloriously dumped itself into the sea after having started in the general direction of Hawaii from our western coast.

Of course the Navy easily could supply cost sheets showing that the taxpayer never paid a penny for these particular machines but really made a profit from their failure. The accounting division of the Navy has genius for such jobs. But what we ought to have is information of the sort that any manufacturer would be compelled in court to furnish if demanded by his stockholders.

Another interesting bit of information would be the reason why the Government in letting contracts to the private manufacturer invariably specifies many standards of material which never are observed in naval factory construction. The navy workers use whatever they may chance to think of, later cheerfully rebuilding if it chances to turn out unfortunately. Of course the answer of the naval "experts" to inquiries of this sort would be that they are doing "research work."

Sure, brethren of the blue coats and gold lace! You're right. It's "research work" all right, the same kind of "research work" in the national treasury that the pickpocket locked up tonight in any G. H. Q. of the American police was caught endeavoring to do in private citizens' pockets.

If genuine aircraft research is to be done for the Army or the Navy it either should be done at McCook Field or given to the manufacturers who, coöperating fully with real naval or military experts, would be glad to follow processes certain to bring actual results.

The immunity of the offenders is astonishing. It is worked in many ways, not infrequently by the dear ladies who with their husbands go to Washington from parts remote and there desire as many invitations as may be to the White House and to elsewhere—invitations which the bureau scouts can get to trade for feminine influence. Executive orders shutting uniforms away from Washington "society" and shutting Washington "society" away from uniforms would go some distance toward solution of our aviation problems. If cool Cal would only sharpen up a pin some day and use it for puncturing stuffed uniforms a series of loud pops inevitably would be followed by increased efficiency in the Air Services.

PRESIDENT COOLIDGE might serve the country that he loves so well a really good turn by asking Congress to send to Germany an expert commission during the coming year to find out how, so soon after the relaxation of the stern restrictions of the armistice terms, that nation, poverty stricken and prostrate as it has claimed to be, has found it possible to spring into world-leadership in commercial aviation.

Such a commission, made up of intelligent civilians, should be able to learn many things of definite value to us. It could report for instance on the aircraft factories of Soviet Russia, which have been developed under German tutelage and perhaps in some degree even for the benefit of Germany, and it might direct our national attention to the fact that Russian air lines, organized and to an extent manned by expert Germans, fly to-day continually over a network of perfectly planned, perfectly organized and splen-

(*Continued on page 72*)

SAFTIBOAT

FOR 1927 SAFTIBOAT retains the same patented seaworthy hydroplane underbody, the same quick-acting safety rudder, the same matchless performance but radical improvements in appearance and rough water performance, engine mounts and propellers have enhanced Saftiboat's beauty, riding comfort, eliminated all vibration and increased speed and fuel mileage.

Detail engine improvements make SAFTIBOAT mechanically perfect.

Write to us for the name of your SAFTIBOAT dealer.

Brownback Motor Laboratories, Inc.
SAFTIBOAT DIVISION
NORRISTOWN, PENNSYLVANIA

(*Continued from page 71*)

didly operated routes which under stress within a single day could link the eastern German border to Japan across Siberia.

This is an easy flight over routes long since perfectly equipped, and has been made scores of times, being, indeed, a daily matter of routine at present.

If the three countries thus associated, Germany, Russia and Japan, were not so celebrated for their love of the United States, the situation which a very ordinary inquiry would bring to light might give us cause for serious thought.

From Russia, by way of Alaska, across Canada to the no longer magnificently isolated soil of the United States, would be an air trip without a single obstacle. Any of the ex-war lords of Germany (of course now utterly denatured—note that I say "of course") flying on this journey might pick up as passengers in passing a Russian Red or two with bayonets for whiskers and a few dear little yellow brethren skilled in that aerial jiu-jitsu, which is known as bombing practice, and if they happened to feel really peeved at Uncle Sam might make us, by this direct and easy route, a visit of importance. Whizz, bang, boom!

It might even be a nice long visit, lasting, in fact, until we devised and carried out a real aircraft construction program and trained a personnel to use the aircraft it constructed—matters which take time.

During the period of that visit we would be extremely busy dodging bombs and doubtless would forget the game of departmental politics while we repelled invaders.

Would it not be nicer for all Americans concerned if we got busy and got patriotic now? A plane and a pilot in time may well save nine, ninety or nine thousand.

If these visitors come over they won't bring with them any of the money which we officially loaned to Russia or unofficially to Germany before we went into the war. They might be troubles, not rubles, which the Russian callers would drop into our laps, and the German visitors while truly leaving their marks with us might choose marks hard to wipe away such as they left with France. Germany makes various sorts of marks.

It is essential to our national well-being that a study of the kind be made and that the men sent to accomplish it shall be civilians capable of thinking for themselves without help from the bureaucrats, and fully posted on and faithful to the welfare of this nation. This visit must not be the sort of junket which our naval and our military stars have shown themselves to be so fond of. It must be no expedition to sample champagne and coffee in Germany, vodka and tea in Russia or rice wine while the eyes of geishas flash with special brilliance just before the sun comes up on Nippon.

IN the report of that able military dignitary, General Patrick, attention is again directed to the fact that at most of the Air Corps stations, there are few, if any, permanent structures, the personnel being in these days of 1927 still housed in the temporary shelters thrown up hastily in war time. He continues: "It is recommended that the Air Corps construction needs be placed as high as possible on the priority list" and "The Air Corps has supplied for National Guard and Organized Reserve training such equipment as it had available. Practically all of it was war-built. It has been retained and kept fit to fly but it is being rapidly worn out and must soon be replaced. Unless provision is made for the purchase of new equipment for this purpose, it will be necessary to postpone or curtail all Organized Reserve and National Guard flying."

General Patrick thus calls attention in creditably (and probably difficult) mild language to a situation which must tempt a gallant soldier such as he to use terms toward Congress which every soldier of necessity must learn because of his association with the Army mule—an animal which cannot possibly behave unless well cussed.

General Patrick's patience and restraint indeed become pathetic, because the situation he thus mentions with such calm is undeniably a vicious outrage upon officers and men who have dedicated themselves patriotically to the service of this rich and even plutocratic nation, and an outrage even greater against their wives and children.

It takes a braver, more devoted man to let his family sleep in the sleazy, rotting structures which now are provided for Air Corps residential quarters than it does to scoot up into the higher atmospheric reaches after records.

Every time I visit Mitchel Field I offer up thanksgiving because I am not a soldier of our Uncle Samuel who in some unessentials is so madly generous and in some essentials is so great a tightwad.

Rugs in the field's residences, though expensive, must be many, for they are needed on the walls to keep the wind out as well as on the floors. There are officers' quarters at that Post wherein the occupants watch their step lest it take them through disintegrating boards. Most of the roofs have been patched with so many coats of tar-paper and roofing preparations that the two-by-fours which hold them groan under the great weight of the repairs. Instead of giving time to flying training the men must study carpentry so that shelters may be kept above their wives and little ones. This is no wild fancy picture. It is a mild statement of a disgraceful fact. Here is an attack by our superlatively rich Government on women and children which compares with what was done in Belgium when Germans earned the name of "Huns."

But if this is a grim outrage then it is deliberate murder which we countenance when we send men aloft in such planes as are supplied for National Guard and Reserve training. It is premeditated murder, not manslaughter. The history of the United States reveals, I think, no official procedure closer to that which, practiced by an individual, rightly would be denominated dastardly.

All the machines supplied for training purposes to these ambitious, devoted, patriotic men are relics of the war and in the whole United States is not one war-built plane which today is fit or safe to fly. A compilation of the accidents, some of them fatal, which already have occurred as the result of this national penuriousness would startle any decent voter into getting out his gun and marching down to Washington to ask the reason why. He would be able to start nothing except a new activity of men well drilled at that special Washingtonian pastime, the passing of the buck; but if he knew he'd go there, anyway, and emit a scream or two of exasperated rage.

Presently, I trust, the nation as a whole will earnestly begin to ask the men responsible why brave young patriots, willing to give up their leisure to learn how to serve their country when the time of need shall come, are thus placed in inexcusable jeopardy by departmental officialdom.

No blame attaches to General Patrick for this grim and scandalous situation. He has asked and asked and asked, reported and reported and reported, without getting the attention of the powers that be.

The President's Aircraft Board, composed, with a few exceptions, of men of no aeronautical experience, spent a few weeks lightly skimming the surface of a very complicated subject and making recommendations to be accepted virtually as the final word in a great five-year program. What they said was listened to by Congress. That which is said by this man, who has spent his whole mature life in becoming expert in the problems of the national defense, has been entirely ignored.

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OUR tachometer shafts have been subjected to the severest tests and have always met every task demanded of them. Built to U. S. Government specifications, of correct design, unsurpassed workmanship and the finest materials obtainable.

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Samples furnished to responsible manufacturers

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Industrial Division
152 West 42nd Street, New York, N. Y.

SINGLE DEP'T OF NATIONAL DEFENSE

(*Continued from page 9*)

historic precedent, long standing custom, and irrepressible jealousies have been made against the reasonableness and fairness of this logic, I believe the force of these questions will persist until they shall have appealed to the minds of the vast majority of all our citizens interested in the broad question of national defense. And when these questions shall arise, those citizens who are disinterested and are primarily concerned with but two phases of national defense, to wit, efficiency and economy, then they will conclude that one single department is the final solution of the matter.

We must bear in mind at all times the point of view of the citizen who is the taxpayer, and who foots the bills in both peace, and war, and who, in time of war, must also do his part of the fighting. These citizens, men, women and children, are concerned with national defense as a single and integral problem, to wit, protecting our shores from invasion and preserving our rights upon the high seas. As a nation we have no aggressive purpose. This republic of free citizens will never consent to enter upon a career of conquest and military glory. But they are just as firmly resolved that their nation's independence and their international rights shall be protected. Therefore, the citizens as a whole are not interested in the Navy by itself, nor in the Army by itself, nor in the air force by itself, but they are interested in the combined result and effect of the joint activities of all of these agencies. They pay their taxes not merely to have a large and beautiful Navy to admire as one would admire a rose garden. They pay their taxes not merely to have a splendid army to execute beautiful parades on memorial occasions. They pay their taxes not merely to be thrilled with the dare devil stunts of aviators from either the Army or the Navy. But the 115,000,000 citizens engaged in professions, commerce, finance, industry, transportation, agriculture, mining, forestry, and all the other varied pursuits, pay their money into the public treasury to be expended by Congress for whatever agency will insure national defense. If any agency becomes ineffective and useless, the taxpayers expect us to abolish it. If any new agency arises that will assist to make safe our nation against invasion and our international rights against infringement, the taxpayers expect Congress to adopt such new agency and to employ it as a fighting force.

Therefore, the people are asking the question of members of Congress as to why there should be two departments devoted to the same and single mission of national defense. It is true one is a land agency, and the other is a water agency, but each of them has within its body an air fighting agency. The people want to know why there should be a single man charged with the special and exclusive function of considering the whole problem of national defense, whether by land, or water, or air, or ether, or otherwise, and to so coördinate and correlate these separate instrumentalities as to compel their harmonious and effective coöperation in time of peace, and in preparing and in training for war, so that when war comes they may the more effectually accomplish the common mission of insuring national defense.

But someone may say that the President is this single individual person responsible under the Constitution for compelling the coördination and coöperation of all the fight-

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ing agencies of the country. Be it so. But it must be remembered that the President is in like manner the industrial chief, the economic chief, the financial chief, the sociological chief of the nation, and the constitutional head of all the departments of the government. Furthermore, the President is not ordinarily selected with reference to his knowledge of, and ability in, problems of national defense. History shows that the people of this peaceful republic select, as Presidents, men that manifest special concern over economic problems, and it would be rare, indeed, to find one man whose reading, observations and life activities have intimately touched both the defense problems and the economic problems of the nation.

In like manner, it has been objected that it will be humanly impossible for one cabinet officer, to wit, the Secretary of National Defense, to comprehend and to administer all the activities that would be included in a Department of National Defense, if it comprised water, land and air fighting agencies. There is a logical fallacy in the thinking and argument of those that oppose a single Department of National Defense when they say that the President can and does do for the conflicting and divergent claims and conduct of the Army and the Navy what we insist a Secretary having authority over both the Army and Navy should do, and yet, at the same time, these objectors say that no single man can have the brain power to oversee both the Army and the Navy. If they expect the President to oversee both the Army and the Navy, and also all the other vast and countless activities of the Nation at the same time, and as the President is only one human being, so they surely will admit that one other man can be found at the same time capable of bearing at least a part of this mighty burden of the President.

And there is where the crux of the argument is. This Secretary of the single department of National Defense would be the advisor to the President in all military matters and would execute the powers of the President in the name of the President. Of course, this Secretary would not be expected to administer the details of either the Army or the Navy, any more than the present Secretaries of War and of the Navy administer details. They sign hundreds and thousands of orders and letters that are prepared for them. They delegate vast powers to subordinates to be executed for them. But we need a single head of all fighting forces to decide conflicts between them, to prevent overlapping of activities, to eliminate duplications, and thus to save many millions of expense. Such unified control of the fighting forces of the nation would so train them to our mutual coördination and coöperation in peace time as to insure more effective joint action in war.

COMPARISON OF AIRCRAFT

(Continued from page 12)

restricted choice of aerodynamical forms and in which the structure did not have to meet all the conditions of the above mentioned service requirements.

In establishing a figure of merit for planes and particularly in arranging a competition between planes, the various points mentioned above must be taken into account either by applying a special formula of merit or by specifying certain characteristics to be met by the entries. For instance, two speed planes are technically comparable only when having equal engine displacements and equal landing speeds; while two passenger planes must be compared from the standpoint of their accommodation facilities, engine arrangement, landing speed and the per cent of payload they can carry.

It will be seen then that comparison of different planes must be made with due consideration as there are many factors affecting their performance. A really fair comparison entails an investigation; the appearance of a plane and a report on its high speed alone indicate very little as to its real value. The following factor (F) is suggested as a means of arriving at an approximate comparison of planes of a similar type:

$$F = \frac{W_t \quad \text{x} \quad V\text{max} \quad \text{x} \quad W\text{u}}{\text{h.p.} \quad \text{x} \quad V\text{min.} \quad \text{x} \quad W_e} \quad \text{where}$$

W_t = total weight, loaded.
Vmax = maximum speed.
Wu = useful load (military load or pay load).
h.p. = horsepower of the engine.
Vmin = minimum speed.
W_e = weight empty.

The higher the factor F, the more efficient is the plane.

In addition to the foregoing it is also necessary to consider the strength of the structure because it would be incorrect to compare a strong, serviceable plane with one which just about stays together. When we have licensing of planes as to their air worthiness then the question of safety and proper strength of the structure will not be an uncertainty, and, since the factors of design will be uniform in specific ships, lightness of structure will be a definite sign of better engineering. In the case of a modern military plane the loading conditions and factors are known because such planes are designed to meet specific structural requirements of the Services.

From this we can see that the comparison of airplanes is not a simple matter and that our races have very little technical value unless more care is exercised in classifying the entries and unless comparative factors are established in judging the results.

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HOUSE OF A THOUSAND NAMES

(*Continued from page 22*)

legs, souvenirs on all sides. In the corners, on the walls, on the floor. Each with its story.

Here is Chet Clark's rudder. The map Russell Maughan used in his Dawn-to-Dusk flight. The bugle hung up by "Little Joe" when the Ground School closed. Loving cups, carrying wings and inscriptions, cleverly fashioned from tin cans. A big red and white flag, bearing the words, "God Save the King." Captured by the Germans from the Princess Pats. Found in a German trench carried by American troops. Stained with mud and blood. Perforated with a hundred bullet holes.

But "Mother" Tusch doesn't care for gruesome souvenirs or gruesome memories. The most bloodcurdling and one of the most interesting she won't let me mention. When she tells a story about any of "her boys," you don't cry. You laugh. Here is one.

Charles Drew and James Newell were pals. Drew was short and stout and Newell was tall and skinny. Mut and Jeff, they were called. Always together. Both went to France as flyers. Newell was attached to the 131st Escadrille, French Flying Corps. Drew joined an American squadron. They used to fly back and forth to visit each other. Drew went over the lines one day and was reported shot down in enemy territory. Soon after Newell was wounded, but got back to his own side of the lines. Months in hospital.

Some time after the Armistice a flying carnival was being held in New York. Two convalescent war flyers met on Broadway. One was short and the other was tall. The short one was limping and had an empty sleeve. He was thin and his hair was white. He wore the ribbon of the D. S. C. and the Croix de Guerre. The other flyer wore the ribbon of the D. F. C. "Say, mate," he inquired, where can I get a Croix de Guerre ribbon?"

The small man removed his green decoration and pulled out a knife. "I've got more than I need here," he said.

"Much obliged. You say your name is Drew? Did you have a brother in the Air Service?"

"No."

"Well, I had a wing-mate by that name. Charlie Drew. He was shot down and killed in——"

"You're a liar!" said Capt. Charles Drew, D.S.C.

In the Spring of 1918 a School of Military Aeronautics was opened at the University of California. Hundreds of young men, from all parts of the West, were stationed here during the period of technical training before going to flying fields. Most of these boys were far from home, and lonely.

"Mother" Tusch's doors, like many others in Berkeley, were thrown open to the embryo flyers. "Mother" Tusch's home was conveniently close. And cozy. One could meet nice girls there. Or just lounge and feel at home. There was an atmosphere. Cheerful. Sympathetic. An antidote to barracks and technical warfare.

Since the War The Hangar has become a rendezvous for all wandering flyers and ex-flyers. Every pilot who passes through the San Francisco Bay region visits The Hangar, gets the latest news of his old Air Service wingmates, tells all about himself, writes his name on the wall in the space above the molding, sacred to pilots, and goes his way—with the comfortable sensation of having achieved family and fame by his initiation into that fearless fraternity of men who conquered the sky which calls The Hangar "home."

METAL STREAMLINED

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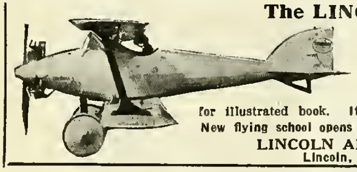

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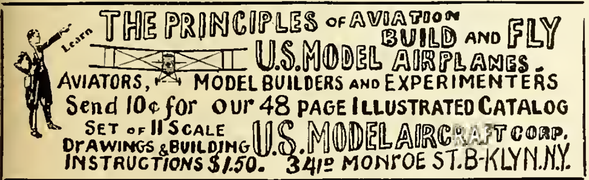

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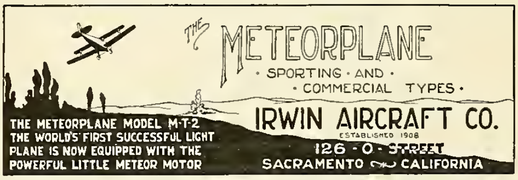

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I hold this truth to be self-evident: that all men are created equal to this extent—and to this extent only—that they are endowed by their Creator with only one certain unalienable Right—the right to chuck up one job and pursue another. I, therefore, in the interests of those who have declared themselves Free and Independent of one job, and who would contract an Alliance with another one, have prevailed upon the Publisher of this Magazine to maintain FREE a file of those seeking employment, and also of those seeking employees; so that the one may be made known to the other, and both benefited.

If pilots and mechanics wanting jobs will write to me, giving their qualifications—if any; and if employers needing men will communicate their needs, I shall be glad to do my best to suit both parties through the files maintained by the courtesy of AERO DIGEST. And if we can help any pilot or mechanic to get a job, AERO DIGEST and myself will feel amply repaid by the privilege of being of Service.

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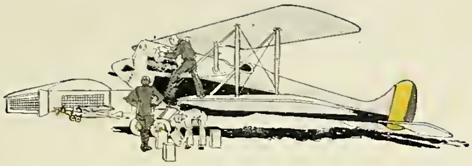

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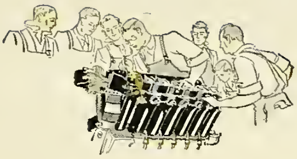

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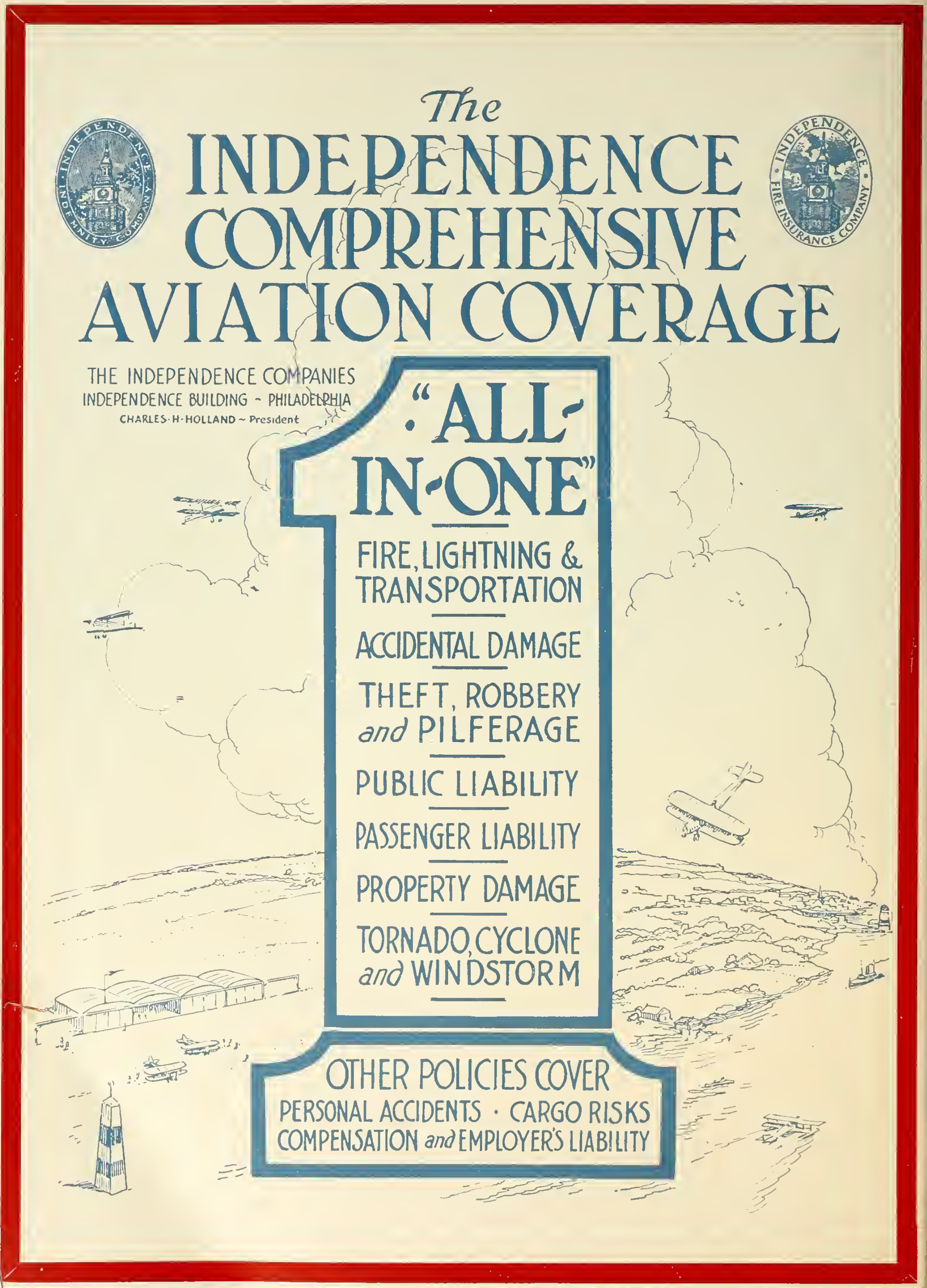

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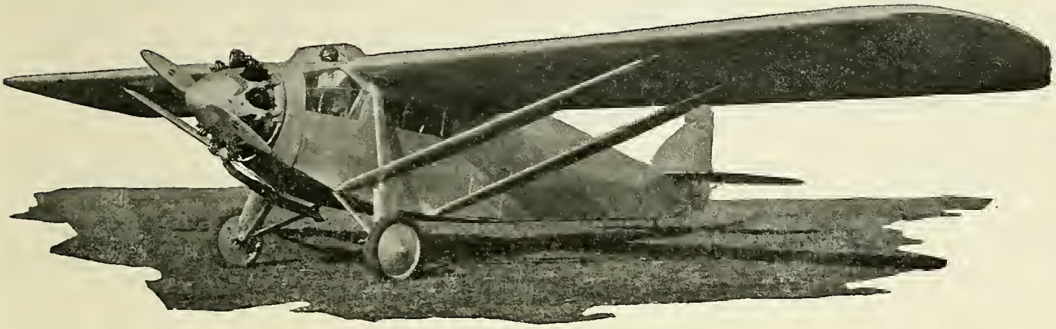

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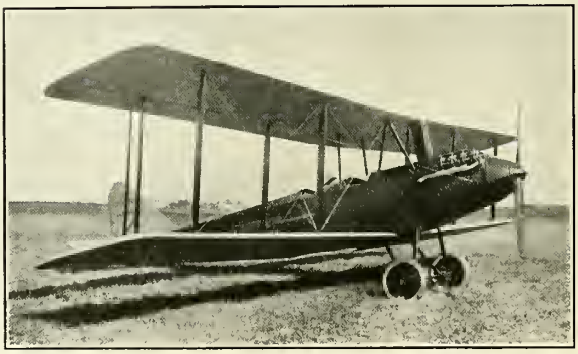

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AERO DIGEST

THE MAGAZINE OF THE AIR

Vol. 10 No. 2

FEBRUARY, 1927

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Phone: Wisconsin 3771. AERO DIGEST Cable Address: AERODIG.

is published monthly by

THE AERONAUTICAL DIGEST PUBLISHING CORP., 220 West 42nd Street, New York City

Frank A. Tichenor, President.
A. Horsfall, Vice-President.
K. Healy, Secretary.

J. E. Horsfall, Editor.
George F. McLaughlin, Associate Editor.
William A. Rogers, Advertising Manager.

LOS ANGELES OFFICE: 1129 Mohawk Street. Frank Samuels, Representative. Phone: Dunkirk 6332.
PHILADELPHIA OFFICE: 1013 Commercial Trust Bldg., S. E. cor. 15th and Market Streets. Phone: Rittenhouse 3247.

Single Copy 25c. Yearly Subscription $3; Canada $3.50; Foreign $4.

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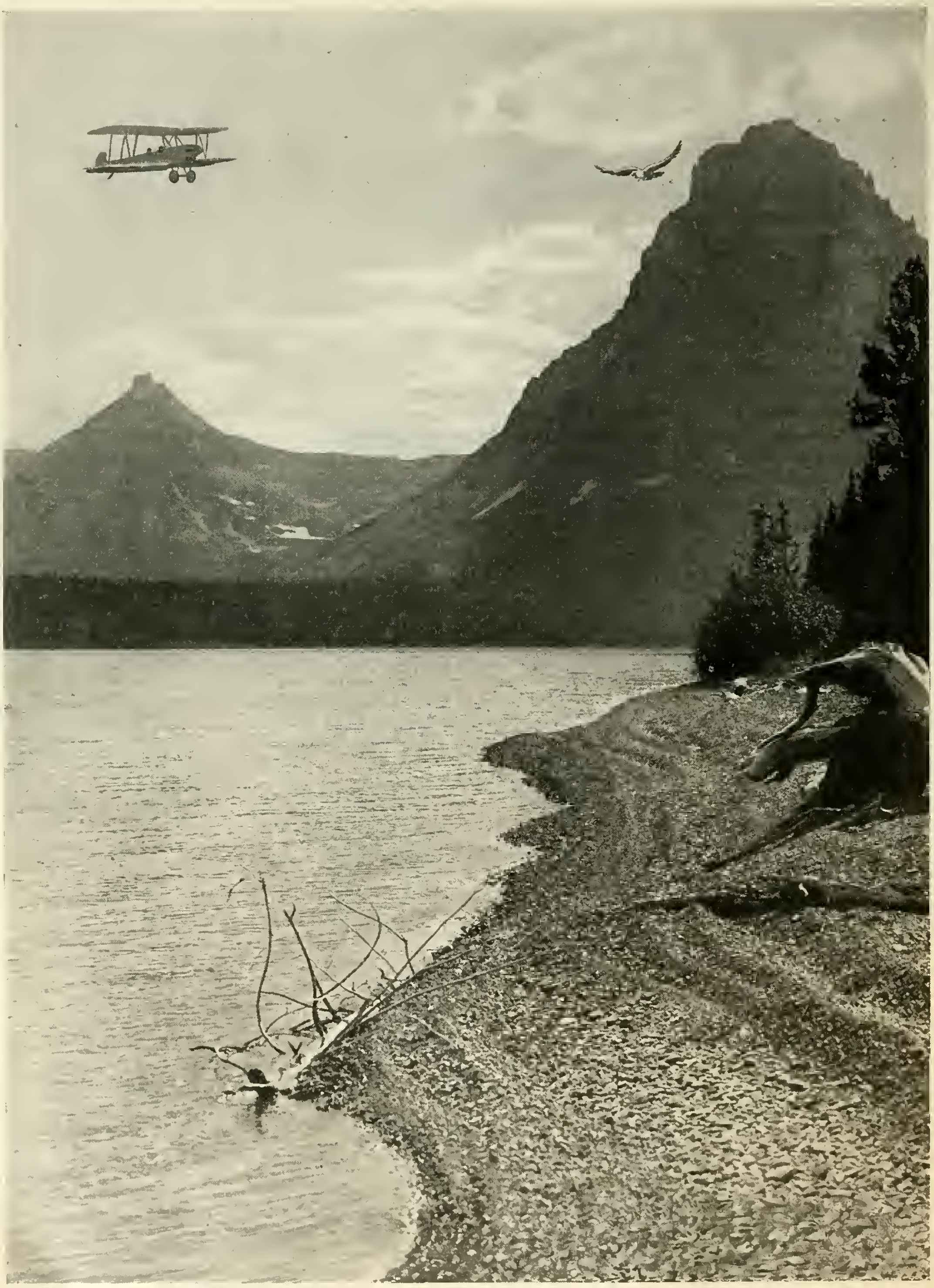
Entered as second-class matter July 17, 1922, at the Post Office at New York, N. Y., under the Act of April 3, 1879. Copyrighted, 1927, by Aeronautical Digest Publishing Corp.



The Eagle—Monarch of the Air—Meets a Rival!

WE MUST ORGANIZE NOW!

By General William Mitchell

WE must have a department of aeronautics! Ten years have passed since the United States entered the European War. Ten years frought with the greatest aeronautical development that the world has ever seen. In every country of Europe one may go to an airport in one of the great cities and take a regular airliner for another city. Where in the United States is such a thing possible?

Can we get into an airliner at New York, put our hand baggage in a compartment and fly through to San Francisco? No!

Can we get on an airliner at Chicago and fly through to New Orleans? No!

Where in the United States does any passenger air service exist worthy of the name?

We have neither real airways, a real aeronautical weather service or radio control for our airlines. Every civilized country in the world except ours has these things handled and administered by a department of aeronautics.

As far as national defense is concerned the only thing we have to fear is from hostile air power. A surface battleship is as obsolete in a modern international conflict as is the bow and arrow. Today our coasts lie undefended from hostile air attacks. The little driblets of obsolete planes attached to the United States Army and Navy are worse than useless. They are not modern either in engines, structure, armament or navigating methods.

What is the reason for this?

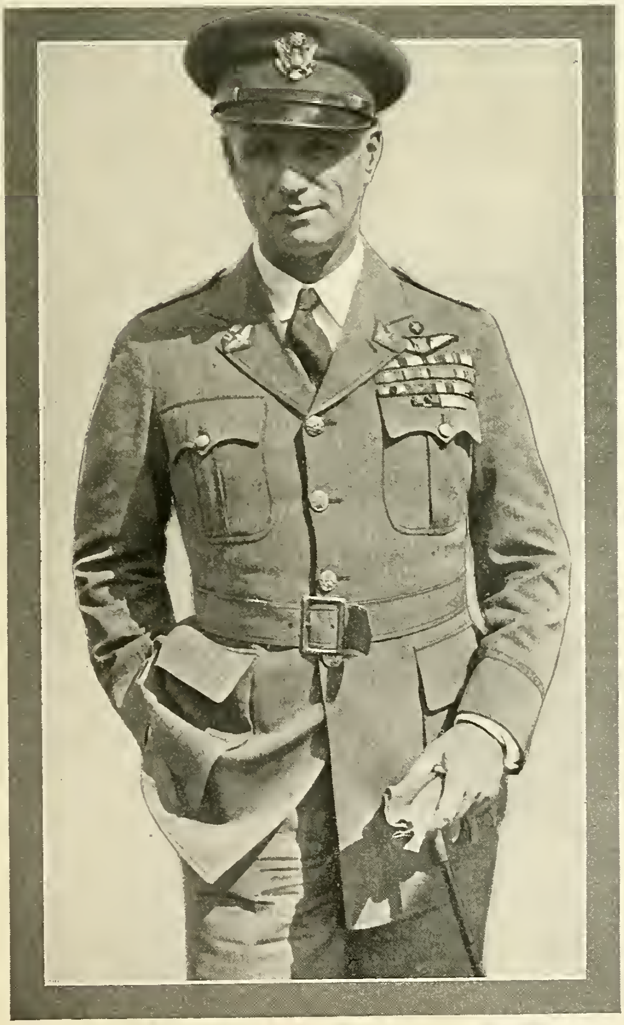
It is because the Army and Navy have been able to retard our aerial development. A separate air force such as all other countries have would relegate the Army and Navy to a secondary position in their influence and prestige.

All the American people are interested in the development and extension of air power for national transportation and national defense.

The Army and Navy have formed a combination to prevent the development of a separate department of the air coequal with them, such as is maintained in all the great countries of the world today. The Army and Navy keep lobbies in Washington that work on Congress, on the purveyors of military equipment and supplies, and on the executives so as to prevent a change of our obsolete military policy.

Last year when these matters were brought up before the American people the Army and Navy, by furnishing false information to the executive and legislative bodies investigating these matters and by the use of every known method by their political lobbies, prevented a modernization of our aeronautics and of our whole national defense. Instead of improving these things they intrenched the old bureaucratic systems more firmly so that today in spite of the fact that Congress appropriated $1,500,000,000 for aviation during the war and in spite of the fact that we have spent over $600,000,000 since the war, this money has been so badly spent by the Army and Navy that if we entered into a great international conflict today, we are as unprepared as we were at the start of the World War.

This is a disgraceful condition for our people to contemplate. America—unprepared, helpless!



Wide World Photo.

General Mitchell continues to fight for our air defense.

At the present time it is impossible for the American people to learn the truth about these conditions from the Army and Navy.

We must have a great national organization which will inform and educate the people from a broad American standpoint about what these things are. This can only be done by forming a society of citizens all over our great country, which will look upon the problem of our development as the greatest national asset which we can obtain, uninfluenced by selfish interests or hope of personal advancement as is the case in the Army and Navy today.

An association that will be dedicated to the establishment of a single department of national defense for the United States with one secretary at its head and under him coequal branches for aeronautics, for land forces and for sea forces. This association will also teach the people how our aeronautics can be developed and applied and what the other nations of the world are doing in the air.

Our United States is a

(*Continued on page 151*)

AIR—HOT AND OTHERWISE

We Won't Be Browbeaten
Why Make Laws?
Cong. McClintic is Awake
Aero Digest Stands Pat

Frank A. Tichenor

TWO of the nation's most efficient supplicants for the Navy's aircraft business have withdrawn their advertising from Aero Digest. The Navy has been their best customer for years.

Their determination to remain out of our advertising pages, we have reason to believe, has been induced by the fact that Aero Digest has been frank in saying that which obviously is true with regard to the Navy and our national air effort.

We regret the absence of these advertisers from our pages, but we even more should mourn the absence from those pages of honest discussion of such matters as are fundamental to the interests of this nation and its aviation development.

Aero Digest's policy has been devised to serve the interests of the man who flies, the man who manufactures, the man who pays—that is, the general citizen, the nation as a whole and, in a sense, the world.

It would take something more than the withdrawal of a certain amount of advertising to convince this periodical that this policy is wrong—say a safe falling from a skyscraper at the psychological instant as we pass, or a wholly fatal whiff of that propaganda gas which ever swirls about the corridors of the Navy Department building in Washington. Only something really drastic ever will make us sufficiently unconscious so that Aero Digest can be thrust into the sad ranks of the publications which eat pocketbook-timidity or what-have-you out of the hands of those who are endeavoring to hold American aviation back in order that their selfish interests may be profitably served.

Because we have dared to cry "Hi! hard aport, there!" to the Naval bureaucrats, whose patriotism seems to be rather to their immediate self-interest than to the welfare of the United States of North America which is supposed to have a flying eagle for its emblem, we find ourselves assailed anon by bricks and then by exceedingly bad odored but inefficient gas which really isn't poison though it certainly is disagreeable.

That eagle's status, it is indicated, has been changed; he is no longer free; he has been shackled by greedy and unpatriotic interests. Our contention is that this is hampering and that what our eagle is for is to fly. If we are wrong, so was George Washington. So was Theodore Roosevelt. Having been an admirer and close student of these greatest advocates of national preparedness we refuse to lose our wits because this gas cloud rolls on the wind in our direction. We adjust upon our handsome but determined noses a protective mask of facts.

The fact is that no highbinder methods will prevent us from pointing out the peril of procedures which we see menacing our national aviation, or endangering the lives of our men in the air. We shall continue with the same energy which so far has enabled us to reveal many sins against our flyers and our country, fully confident that that is what we're here for, that that is the American businessman's way and the way of good Americans in general, and that those who through a misconception of what is wise policy have been convinced otherwise, sooner or later will come back to normal mental functioning.

We shall do everything that's fair and clean for all good people who may advertise with us, for we know that will help us and we trust it will help them; but we shall not fight for wrong because some advertiser wants us to, or fail to fight for what we think is right because, by chance, that course may peeve an advertiser.

We shall not fertilize our pages with corruption to make advertising grow. We prefer less advertising and a clean magazine.

Being well acquainted with the Air Klan we are sure that the tremendous majority of aircraft manufacturers who have dealings with any department of the Government will encourage us in every detail of the policy we have adopted and intend to stick to, and try to discourage any bureaucrat in Washington who mistakes the buttons on his chest for insignia of divine right and so misinterprets his commission to act as a public servant drawing Government pay as to mistake it for a license to pervert his patriotism and strive for special interests rather than the common good.

Now, as we look down at the Mexican border and realize what might have happened and what may, indeed, occur at some not very distant time, is a bad time for anyone to try to compel Aero Digest to support selfishness, nay, favoritism (we might as well be frank) in Washington.

If more people studied aeronautical matters as carefully as Aero Digest does, and spoke as frankly as we do about such facts as study may reveal, some, whose judgment seems to be tailspinning but whose instincts we believe are of the very highest, would not be diverted thus from general, national and necessary comprehensions into narrow, anti-patriotic and short-sighted conclusions which can end only in a crash.

The Mexican flurry (if it passes into history as a mere flurry) has stirred the public mind. Aero Digest knows this, though the bureaucrats and the manufacturers who wish to curry favor with them at whatever cost, seem not to comprehend the fact.

Since the Taft-Madero days, Mexico, sad victim of bad government, continuously has been piling up anti-American prejudice, partly as the result of our own foolishness, and partly because of propaganda from outside. Now Central America has been very greatly agitated and South America inflamed against us.

All Europe hates our Monroe Doctrine and now and then some group of statesmen over there finds somewhere around their works a chunk of money that is not nailed down and spends it on what they think is the worthy purpose of trying to upset our placid supremacy upon this continent, which Washington and all of our farseeing founders dimly visioned as essential at the very start and which James Monroe crystallized into a declared policy.

We're a big boy now and busy at attractive and we hope useful work. But "we should worry" ought not to be our national motto. We shouldn't worry needlessly, but we should heed the warning of George Washington about what is best to do in time of peace.

He did not say "In time of peace pull wires." He did not say "In time of peace take your advertising away from any publication which dares to chide such wire-pullers as by ill fortune have got into national Government and partly paralyzed one of its most necessary arms." He didn't say a lot of things, but he did say one thing: "In time of peace prepare for war!" Today that means prepare an air defense.

(Continued on page 144)

FLYING AT CLOVER FIELD

By Will Rogers

NOW I haven't said anything here lately in the way of advice. I have just kinder been waiting for Washington to see some stuff for themselves. But it looks like they are all so busy counting the casualties from "Old Crow" made by the United States distilleries, or is Smith going to be allowed to sit down, stand up, or go home, or make Nicaraguan elections pure like ours, and dozens of minor things like those. Now I am just back from California and in my official capacity as mayor I naturally had a chance to look into all our resources in and around Beverly Hills.

Now, the Government has adjoining the outskirts of my municipality what they refer to as an aviation field. It is a field. It's a good field. It's called "Clover" aviation field. There is no clover on it; neither is there any aviation. But there is plenty of room for both. If the Army is not going to put any aviation on it I personally will furnish some clover for it. For I don't want it to be misnamed any more than it has to be. It's situated near Santa Monica. It's where the "round-the-world fliers" took off from. But we don't want to limit it to that exclusively. We would welcome some local flying; somebody that maybe wasn't going any farther off than Hollywood. We just want enough activity there so that we won't be called a liar when we refer to it as an "aviation field."

Now in the Government "fiction" records this is what this field is supposed to house: "The Three hundred and twenty-second Pursuit Group, consisting of the following units: Four hundred and seventy-sixth, Four hundred and seventy-seventh, Four hundred and seventy-eighth, and Four hundred and seventy-ninth Pursuit Squadrons, the Three hundred and eighty-fifth Service Squadron, and a headquarters detachment." Now, in a presidential message that would be the statistics of the preparedness of this particular field. Now, here is the funny part about it that will fool you. This whole thing, all these numbers and different detachments are officered and manned up to their real strength. There is between 500 and 600 men all in the Air Corps Reserve that are there to get training at this field—more than in any other area in America. Conditions are more suited to such training. These officers are all from the war and cost the Government $15,000 a man to train up to the time they got their commissions, and they have received as much since then, so you see they represent an investment of at least $10,000,000.

© P. & A. Photos

Will Rogers takes his cue from General Mitchell and does his stuff in the interests of national defense.

Well, I had heard about the field, and I had heard about the men, so, as it was right across the canyon from me and I had never seen any of them flying from where I was, I just saddled up an old plug the other afternoon and rode over. I thought maybe they was doing some invisible flying that I couldn't see from over my way. I saw some big old "hangars" or hay-barn-looking things. I thought, "Well, they got them full of airoplanes." I rode up and peeped in. I couldn't see even an old broken propeller. Here was a beautiful field, 600 trained men, and if you think this is comedy that I am going to tell you you are cuckoo. It was so sad it wasn't even funny. Six old-time Army planes—six, mind you—of the type we trained the boys in before we went into the war. Here was 600 men offering to give their time and risk their lives—without pay, mind you—and here is what they have to do it in. Made in 1917, 10 years old. Talk about flying them, why there wasn't enough of them for some of the boys to even see.

It figures out that if each one of these 600 reserves Flying Corps wanted to kinder keep his hand in, it would come around to him to fly 15 minutes every month. That is if none of the planes were ever out of order, and they changed fliers in the air, when your 15 minutes was up why you jumped out and another man jumped up in the air and took the wheel. Of course, if, say, three of these old planes was to die of old age, and leave you a flying strength of only 50 per cent, why, then, you would only get 7½ minutes, or about an hour and 20 minutes a year; that is, in case all three planes keep going night and day 365 days in the year, to say nothing about how many would lose out on leap year. Now, an hour a year is not what you would designate as intensive training. Of course, it gives these men a chance to do something else on the side; their mind is not exactly taken up entirely with aviation.

But don't go and sit down and start to reconcile yourself with the fact that you are being protected on our west coast by these 600 men all trying to get into three planes at once. I don't want to be an "alarmist," but you haven't got near that much protection. Father Gloom is knocking on your door with the follow-

(Cont. on page 152)

ENGINEERING IN AIRCRAFT

PART 1

By Dr. Michael Watter

THE romantic past of aeronautics is a fascinating story of daring and ingenuity where man's genius waged a winning fight with the elements. The vision of man high in the sky, free as a bird, led many a man to try his skill and courage—and sometimes pay with his life for such boldness. But man cannot be stopped in his fight for knowledge and comfort and, after centuries of failure, the object was achieved—man flew. Most of us know the names of the pioneers of flying. After these came others who tenaciously worked to perfect the then uncertain art of flying, and to them is also due a large part of aeronautical success.

In the early days flying meant "taking your life in your hands," as very little was known of the intricate problems connected with this marvelous achievement. In every civilized country there was at least a group of scientists who were fascinated by the new problems, and there began intensive work on the complicated problems of aerodynamics and refinements in structural calculations.

As a result we now possess methods enabling us to cope with the most complicated problems of design and to obtain results as accurate as can be desired for practical purposes. At present we have theoretical methods of calculations and means of scientific testing, and also a library rich with accumulated information of a most varied nature. No matter how original may be an individual design, there are methods of verifying and ascertaining its peculiarities even before the contemplated craft is built.

Aircraft building is now an established industry, and aircraft design is a science—not art. It is not necessary to wait until the aircraft is tested to know whether it can fly and how well it flies. Quietly sitting in his office, an engineer is able to predict, with as much certainty as in any other branch of engineering, the performance, capacity and strength of his design. The "cut and try" methods are substituted by careful calculations, and points of importance are verified by tests of details. Men in the industry remember the time when designing was done by "relative comparison"—if a plane was able to fly and showed no tendency to lose in the air any important part, such as a wing or engine, and was reputed to "handle well," it was established as a standard of achievement, and designers noted down the relative sizes of tail, ailerons, center of gravity location, structural details and dimensions of members, and dared to make no more radical change than alter the shape of the cowling.

I do not condemn the method of noting down what someone else has done; in fact an engineer does well to establish a record of how things should and should not be done. But each original design has its specific characteristics. There are numerous factors affecting the size of the tail, ailerons, etc., and the best results cannot be achieved by merely using another's percentages. As regards structural problems, it is not only detrimental but often dangerous to design by relative comparison. Fortunately the aircraft industry has entered the era of technical engineering. Calculations and careful analyses now replace the old method of "it looks strong enough."

As in any other branch of engineering there may be a rare combination of circumstances which cannot be definitely predicted and which therefore leads to unexpected results. This possibility is no more probable than in any other engineering products.

Every potential user of aircraft should know of the great amount of engineering work necessary in designing them, and how every detail is scrupulously investigated by designers. Let us consider the typical procedure of design step by step and review modern methods and means of solving different problems:

First of all, the purpose of the craft determines the arrangement and accommodations of passengers and pilot, equipment, installations, etc. From experience and approximate calculations, an estimate of weights is made and a tentative center of gravity determined. After this, the service requirements will regulate, within the limits of balance conditions, the most desirable arrangement of the wing or wings to be used to secure good flying visibility, landscape visibility, gun-fire range, spotting vision, or whatever the purpose may require. Each problem should be approached without prejudice as to arrangement and judged on its own merits as applied to the design under consideration. Comparative short performance estimates and "list of merits" is a helpful guide in deciding which particular arrangement is apt to be more desirable.

The list of merits is an analysis of how well the layout meets the purpose, service, requirements; how suitable it is from the standpoint of service conditions, fire hazard, cost, comfort, storage requirements, rigging, structural advantages, weight, appearance and so forth.

Different wing profiles are considered. A choice is made of what appears to be the best one—best for the particular requirements of the craft. After this, a complete aerodynamical investigation follows. The choice of wing sections is only a preliminary step to a more thorough analysis of different possible combinations. Wings suitable for a given design usually differ very little. There is no magic wing curve which greatly surpasses the rest; an aerofoil may be better aerodynamically and yet another profile may prove more advantageous. It is the combination of wings and their relative arrangement that is more important than the individual characteristics of a wing.

Decalage, the combination of different wing profiles, stagger and sweepback are powerful means of improving characteristics of a wing cell. This improvement if properly used is a gain not only aerodynamically but also structurally. The principal aerodynamical benefit gained is stability and controllability of the craft. With the arrangement of the cell adopted it is possible to determine the required sizes of stabilizing and controlling surfaces, their initial setting, degree of stability and maneuverability, stick forces and angles of elevator settings required in different conditions of flight.

The characteristics possible to predict are very complete. We are in a position to predict, with accuracy surprising to the layman, the high speed, minimum speed, speed of climb, time required to climb to a certain altitude, the ceiling and many other characteristics of an airplane. We are also able not only to ascertain safe handling of the craft but achieve even the desired degree of stability and controllability required by the purpose of the machine.

A military fighting airplane, for instance, must be less stable and more maneuverable while a commercial transport should be more inherently stable and slower in its maneuvers.

Wind tunnel research plays a very important part in accumulating scientific data and furthering the science of aeronautics. The characteristics of most unusual designs can be ascertained by means of such

(Continued on page 160)

THE YARNS OF "HELL'S BELLS" O'NEIL

How to Run an Armistice Banquet

By James Warner Bellah

"NOW," says "Hell's Bells," "in order not to make the same mistakes the Department of Hoboken made during the Great War for Civilization, it's about time we got out a pamphlet on Combat Principles, Security and Supply and The Care of the Feet—to aid us in the annual Great Wars for Gastricization that occur in this great land of ours from the rock bound coasts of Maine to the sunny shores of California, between the hours of seven p. m. and three days later, on the evening of November the eleventh every year.

"Under the general heading of Equipment it is well to note that nothing looks worse than a pilot in civilian clothing, unless the pilot happens to be René Fonck in which case it doesn't make any difference what you wear for your medals will hide all but your instep. On the other hand, if you only have the Victoria Cross, the Legion of Honor and the Congressional Medal by all means come in uniform rather than evening clothing, because if you come in evening clothing someone may mistake you for Dudley Field Malone or Gene Tunney and you'll be defending a divorce case or fighting Dempsey, instead of three ground majors, before the evening is over."

"Hell's Bells" tipped the vino—"Now then, suppose you only have the Victory Medal (no stars). First of all, in this case, it is well to join the United Daughters of the Confederacy, the Sons and Daughters of Over the Jordan and the Society for Propagating the Name of Horace Greeley. This gives you three more ribbons. A hair ribbon, an old silk scarf and a piece clipped from an old pair of suspenders (Tripler's $7.00 —ask for *braces*) will give you three more to sew up. Smear the whole collection with a little face cream, wear a Polish uniform and a pair of American Naval wings and no one will ever suspect you of never having gone solo but once and not very nicely then. A first aid kit and a tin hat comes in handy with this outfit, because later in the evening three nasty stevedores from Old Tronus Squadron, having tired of leading the orchestra, will establish a strongpoint on top of the piano and start pegging glasses and pieces of the saxophone at everbody in the room who hasn't killed ten Huns and flown three thousand hours in an S.E.5—at which juncture, it is well for all two-seater pilots to duck into the communication trench leading to the speaker's table, work their way around the dead bodies in the traverse and crawl through to Major Vaughn's and Major Springs' dugout where, by the way, they will find the only decent liquor in the room and forty men to swear to it, b'God.

It's well to leave in threes for the sake of stability.
Diving into a bass drum for a 3-point landing.
The undertaker's men romp to and fro
Shot full of holes, 9 years ago.
The toastmaster
Dick Huemer

"Presently a man will come up and say 'yfacesawflyfamiliarwhereviseen youbefore?' and go away. In a few moments he will come back and say 'Thisisoldjakeheming-way-memberoldjakeheminway? Hewasthere toowasn'tyou-Jake?' Only the man won't be Jake Hemingway in the first place and in the second place he won't be there for you to tell whether he *is* old Jake Hemingway or not, because in the first place the other man will have forgotten to bring him along as an exhibit. The third time the man comes back he will rip off his coat, vest, shirt, collar, tie and undershirt in one fell swoop and show you the route taken by a piece of 'archie,' half a radiator, four machine gun bullets, a carburetor, two piston rods, a sump casing and his own observer when they passed lightly through him nine years ago. After that he will dive into the bass drum for a three point landing.

"It is now time for the speeches.

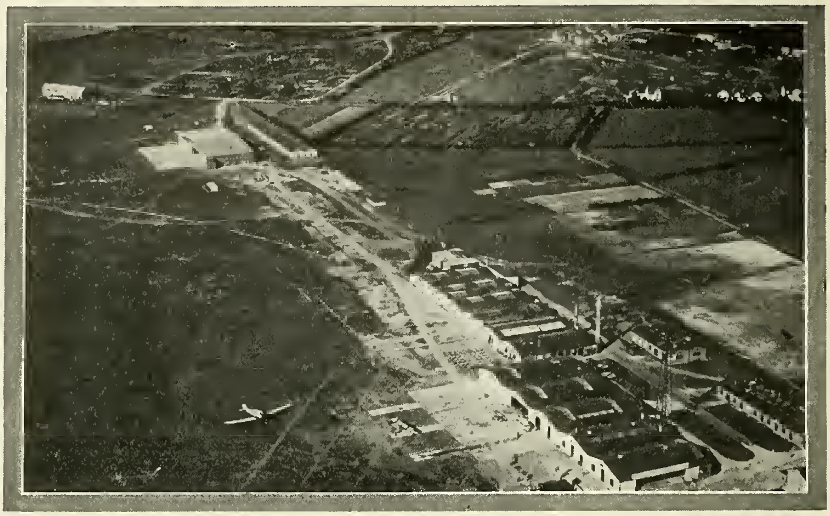
"Cy Caldwell will go back to Central Park to sleep with his armadillo. The last remaining members of old Whatsis Squadron will rip three flights of stairs from their moorings and jam them down the elevator shaft. The major who was hit with the old linotype machine during the first quarter will return wearing a brigadier general's stars.

"It is now time for the speeches.

"About this time the manager of the hotel will club his way into the room, wild-eyed and frothing at the mouth and shriek 'Where's Annie?' He will be jumped upon and given an opiate and sent to Ward's Island, but he will never be right again until the option for the next three years' banquets is cancelled. *(Cont. on p. 152)*

OPERATIONS OF HAMBURG AIR HARBOR

By Paul Dietz



Hamburg Municipal Air Harbor—one of Germany's most important commercial air stations.

THE Hamburg municipal air harbor is located in Fuhlsbuettel, a suburb of that great commercial city, half an hour by automobile over good roads to the business center of the city. It is also accessible by the elevated-underground electric lines. Before the war, the harbor was equipped with a large Zeppelin hangar and during the war it served as a base for planes operating on the west front. Following the war the Zeppelin hangar and the planes on the field were destroyed.

In 1919 when commercial aviation received its first modest subsidy from the state of Hamburg, only a few small shacks remained to show that it really was an aviation field. Hamburg, a wealthy "free city," could expect little or no aid from the Prussian government, which was expending all of its energies upon the development of the Templehof Harbor in Berlin. And the great work in Hamburg is still practically without government aid. The state of Hamburg, and the Hamburg-American Steamship line are doing practically all of the improvement work, and furnishing the personnel for field operations. Hamburg's strategic commercial situation makes its air harbor of particular importance to European commercial aviation.

MATERIAL EQUIPMENT OF HAMBURG

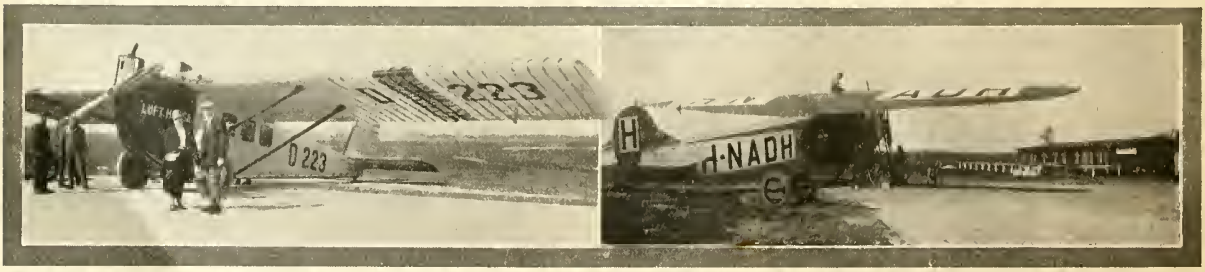
The improvements of the field proper, such as the filling in of low portions, and the tilling of the whole were executed by the convicts of the Hamburg state penitentiary located about a half mile away. As a recompense the air harbor officials permit a large flock of sheep, owned by the penitentiary, to graze on the grass of the field, which keeps the grass in good condition without expense. Since there is little flying after 6 p. m. the sheep are on the field all night. During the day they graze outside the huge circle which marks the improved 150 acres of landing space. The outer edge of this circle is covered with white crushed rock; a large "H" in the center of the field shows the pilot which harbor is below him.

Along the edge of the circle are about a dozen hangars housing the machines of local flying companies, advertising men, field photographers, flying schools and also the factory of the Baeumer Aircraft Works. Baeumer, one of the aces of von Richthofen's squadron during the World War, now builds small fast sport planes equipped with three-cylinder American engines. He is also head of a flying school which is located on the field. Along the entire length of the hangars, to a depth of about fifty feet, cement slabs make a dry working and loading place for these planes.

A separate hangar houses the plane of the Hamburg Weather Bureau, used for high altitude weather observations. The harbor police are also housed here. At one end of the line of hangars is a fueling station with large underground tanks. Next to this station is an observation platform.

Directly to the rear of these hangars, which are rented by the State to private concerns, are located the apparatus rooms of the radio station and the official offices of the Weather Bureau. The towering wooden aerial masts have red lights at the tops, marking their location to approaching air pilots. A few feet from the aerials a large tower has been built, equipped with fog-penetrating red and orange lights, powerful enough to be seen 40 kilometers away. A large restaurant is also located nearby.

Regular commercial airline flying is concentrated at the opposite end of the field. Here a hangar, approximately three hundred feet in length with two-story offices at each end, has been constructed of steel, concrete, and brick veneer, with many windows. It can house a dozen of the moderate sized five-passenger planes. Great duralumin



The Dornier-Komet II. 5-passenger Luft Hansa plane, and the Fokker VII, 8-passenger Dutch K. L. M. airliner, at Hamburg.

A 3-engined Junkers G23 airliner at the Hamburg airport.

doors can be swung to the ends of the building, opening it to its full width.

In the brick structures at each end of the hangar are located passenger rooms, baggage rooms, customs office, pilot rest rooms, bureaus of the agents of operating companies, rooms of the supervisor of flying activities, weather bureau, telegraph and wireless rooms, and mechanics' store rooms.

A small pumping plant located near this building keeps pressure in the two huge underground tanks of fuel and oil located at each end of the cement platform in front of the hangar thus providing easy access for the great air liners, allowing them to roll directly over the hose connections and be refueled in a few minutes. Near "Halle A" as this hangar is named, are located the new devices which aid radio operators in ascertaining the exact position of pilots flying in inclement weather. On the roof of "Halle A" are located flagstaffs bearing the standards of the various operating companies, surmounted by red lights to warn approaching pilots. A great electrically-operated siren of great carrying power announces the approach of planes.

Experiments are being made to determine an efficient system of field lighting. Some European fields have a string of low poles around the field, with wires strung from one to another, and with lights attached to the tops of the poles. But this is regarded as an additional hazard of landing. The plan now under consideration will require underground conduit around the entire circle. Lights will be under heavy glass covers incased in cement pits, level with the surface of the ground. The colors of these lights will be chosen from the government field lighting code, and will clearly mark off the points of the compass for night flyers. At the present time powerful arc lights are directed on to the field when a night landing is to be made. At all times during the day a member of the police traffic squad is stationed near the center of the field. He is armed with a small pistol which fires a brightly glowing missile, and trails off a long thin line of smoke. This serves as a secondary aid to the wind vane and the smudge fires in showing the wind direction. The smudge fire is a permanent wind guide. It is built underground at one end of the field, and throws off a dense but narrow ribbon of smoke.

New equipment, new buildings and new and improved roadways are constantly increasing the harbor's importance. However, the above is the condition of the material equipment during the past summer season.

Herbert Photo.

Loading newspapers on an Albatross L72a plane at Hamburg.

PERSONNEL ORGANIZATION

The central offices of the air harbor are located in the Hamburg-American Line Building on the Alsterdam, in the heart of the business section of Hamburg. Here the directors and the superintendent of the field meet, requests for financial aid go to state heads, advertising is managed, and all correspondence with operating companies is carried on.

es for the rent of hangars and field equipment are collected through this office, and landing, starting and overnight hangar service fees for operating planes are collected. The other main controlling agencies are those supervised or operated by the State in the harbor. Under these two general heads —City Central Office and State Maintained or Supervised —we can now study the actual field operations.

Working in the harbor under the supervision of the Central Offices are three general managers—the Supervisor of Harbor Flying Activities, the Supervisor of Technical Harbor Work, and the Manager of the Ticket Offices and Passenger Service.

The Supervisor of Flying Activities and his staff are in direct charge of all buildings and their maintenance, of the data on starts, landings, and overnight hangar service, of rentals for hangars and equipment, and of special field exhibitions. His force cares for the maps, plans, routes, schedules and correspondence of the flying field. He keeps track of all planes to and from Hamburg while they are in the air, and when they arrive or leave. He pays the employees of the harbor. Under his more general supervision are the airplane factories on the grounds, air photography, flying schools, operating companies, and also the newspaper planes carrying material to and from other cities.

Coöperating closely with this officials and his staff is the Supervisor of Technical Harbor Work. He is responsible for the care of the grounds, the smudge fires, the lights and the buildings. He maintains the power plant, has charge of the sale of fuel and oil, cares for the new roads now building and maintains the old ones, runs the pumps and the machines, and maintains order in the hangars.

The Manager of the Central Ticket Office has a large share of the advertising work to care for, as he is general supervisor of the hundreds of ticket agencies in Germany and abroad. He makes contracts with agencies, furnishes them with tickets and advertising material, collects the ticket money and remits the agent fees, has charge of the ticket sales on the field and in the city offices created especially for this purpose. He also cares for the passengers before their planes are ready to leave the ground. His force supervises the private branch telephone exchange on the field, and acts as an information bureau for officials and guests.

(Continued on page 153)

U. S. AIR ROUTE OPERATORS' REPORTS

Government Operated Routes

Transcontinental, New York-San Francisco (2664 *miles) and Overnight, New York-Chicago* (726 *miles)*

DURING the fiscal year ended June 30, 1926, planes flying at night carried mail on government operated lines nearly one million miles, the exact figure being 945,654. Total mileage flown, both day and night, during the year was 2,256,137 on a schedule calling for 2,411,059 miles of mail trips, making a percentage of performance of 94. Contract routes, none of which were operating prior to February 15, 1926, added a mileage between that time and July 1, of 378,478 miles.

During the fiscal year government-operated routes transported 353,641 pounds of air mail, of which 107,047 were handled by the overnight service which was inaugurated at the beginning of the fiscal year between New York and Chicago. The poundage for the preceding fiscal year, which did not include the overnight service, was 232,513.

The total excess postage received for air mail transport during the year was $861,865.05, an increase of $259,237.51 over the preceding year. Of the former amount $160,881.04 was received on the New York-Chicago overnight route.

Since the end of the fiscal year receipts on the transcontinental route have been increasing by leaps and bounds. For the month of July they were $73,137.45, an increase of $12,703.80. For August they were $78,275.66, an increase of $18,459.69. September with receipts of $82,769.59 showed a gain of $22,776.87 over September, 1925, while the October receipts of $90,906.10 were $30,642.82 greater than October of last year.

The operation of this great arm of the Post Office Department last year cost $2,782,422 and the appropriation was $2,885,000. Of the amount spent, $1,180,595 was for salaries and wages; pilots' pay, $197,496; buildings and improvements, $294,298; gasoline and oils, $232,738; other supplies and service, $877,295. Their inventory shows property valued at $3,816,679.

Both the transcontinental and the overnight New York-Chicago routes will be turned over to private operators within a short time.

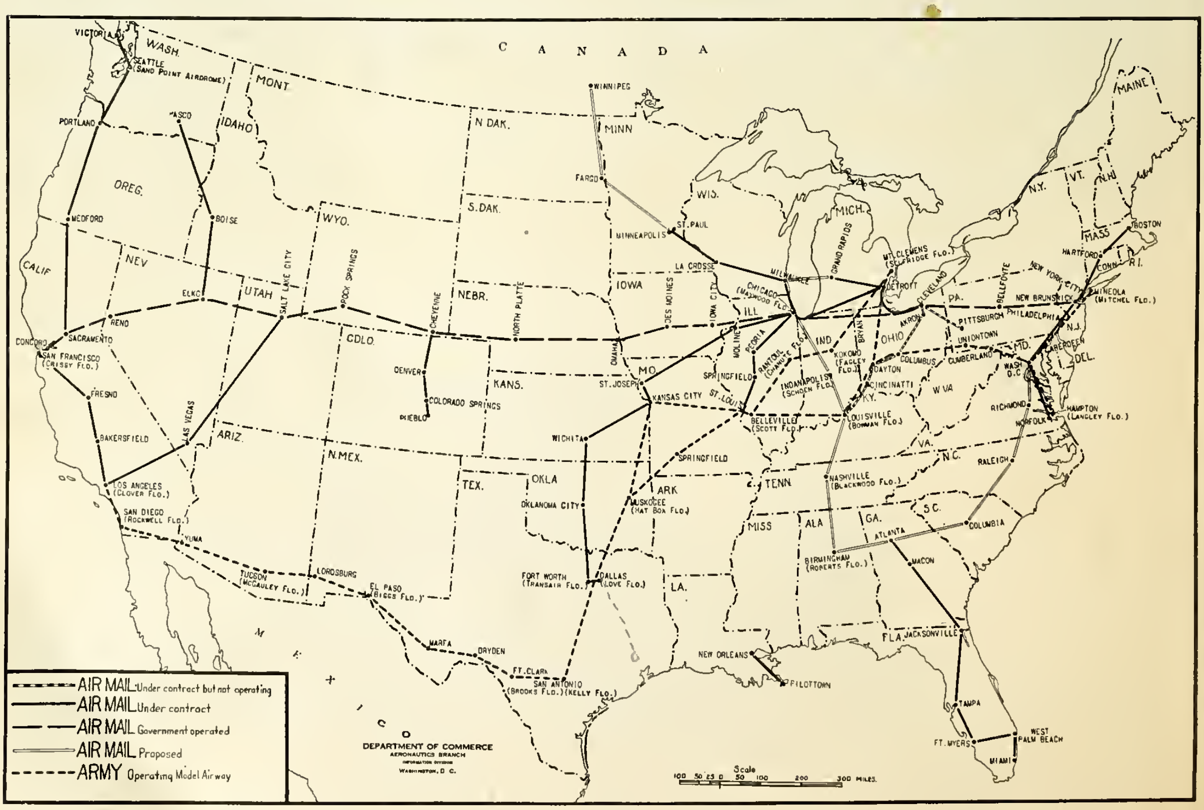
C. A. M. No. 1, Boston-New York (192 miles)

Operated by Colonial Air Transport, Inc.

THE Colonial Air Transport, Inc., took off to a flying start on July 1st, 1926. Since that date daily operation between Hadley Field, New Brunswick, N. J., Hartford and Boston has been maintained with no crashes, no forced landings due to mechanical failure and no injuries. And, with the help of increased coöperation from the U. S. Weather Bureau and added operating experience, the efficiency is constantly improving.

The breaks have not all been favorable, however. Due to the delay in the lighting of this route by the Department of Commerce, schedules have been altered to such an extent that little or no saving in time can be shown the New England users of the air mail. This unfortunate circumstance has reduced their load to a minimum, but with the lighting nearing completion, an early increase is anticipated.

Meanwhile, the organization has concentrated upon planning for future extensions westward, counting upon resumption of activity in New England when warranted by the service they can offer. *(Continued on page 154)*



Map showing the United States government-operated, contract and proposed air mail routes, also the Army Model Airway.

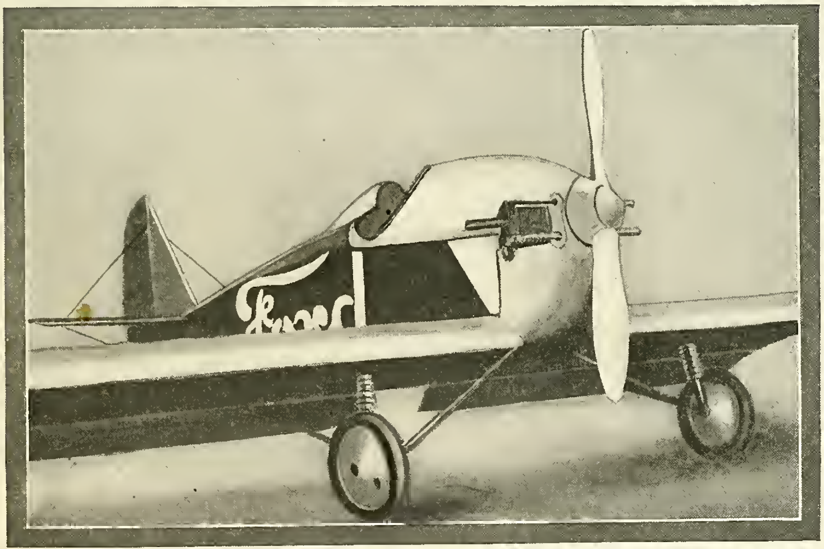
FORD'S LATEST MONOPLANE

By

George F. McLaughlin

HENRY FORD'S new single-seater light monoplane was shown publicly for the first time last month in New York City. Much interest was shown in it by the thousands who visited the show room where it was featured in connection with the Ford Transportation Exhibit. Curious spectators sought information on the new Ford of the air; engineers and others connected with the aeronautical industry were apparently impressed not only with the ambitious scale upon which the Ford interests are apparently progressing in the air transportation field, but also the favorable attitude of the public toward the Ford policy.

In its present form the new Ford light plane is regarded as more of an experiment than as a contemplated production job. The first light plane built last summer to the designs of Mr. Otto Kappen (who is connected with Ford's Airplane Division) was powered with a foreign engine, the 35 h.p. three-cylinder Anzani. The present plane, although very similar in general appearance to the original monoplane, is provided with the long-waited-for Ford aircraft engine. So the new plane may well be regarded as a flying laboratory for testing out the new aircraft engine.



Drawn by permission, from International photo.

The latest Ford light monoplane which was exhibited in New York last month.

The engine is a two-cylinder air-cooled type. The two cylinders, of cast iron, are horizontally opposed, offset because of the double-throw crankshaft. This type of cylinder arrangement is easy to balance, and vibration presents no problem. The cylinders are of substantial dimensions. The bore is 4.75 inches and the stroke 6.75 inches. Power is reported as 40 h.p. Equipment consists of a Scintilla or Berling magneto, Mosler spark plugs and Stromberg carburetor. Overhead valves are operated by large-diameter push rods, forward of the cylinders.

An interesting feature of the engine design is that it is proposed to use the same cylinders, valves, rods, etc., in producing a line of engines ranging from the two-cylinder 40 h.p. to a nine-cylinder 180 h.p. engine. With three-cylinder and five-cylinder arrangements between these types. This would give a wide choice in power plants to meet the needs of any design of commercial airplane. If present plans are realized, Ford distributors throughout the country will be in a position to supply parts for their engine in the same efficient manner that car parts are made available.

The light monoplane is of the low wing cantilever type. Wing span, 22 feet. The overall length is 16 feet. Wing panels are of deep section, the Gottengen No. 387 wing section being used. Wing beams are of wood with stamped sheet duralumin ribs between. Ailerons extend throughout the span. Wing tips are of semielliptical outline in plan, the wing tapering in thickness at the tips. Ailerons are arranged so they may be used as flaps, both being depressed simultaneously when desired to slow up the ship in landing. To prevent nosing over, the elevators are connected with the wing flaps to raise them in order to depress the tail as the flaps are lowered.

The wheel track is exceptionally wide, 7 feet 6 inches. The divided axle is hinged at each side of the body. Shock-absorption is taken through a group of solid rubber discs on the vertical landing gear member which is attached below the front wing spar; the rear landing gear member terminates at the rear wing spar. All are constructed of steel tube and may easily be faired into streamline form. Conventional disc-covered wheels are used.

The tail skid is replaced by a small rubber-tired wheel (Palmer type) which is carried beyond the body termination, below the rudder. The rudder and wheel are controlled from the rudder bar, so that steering on the ground is accomplished by the same movements that control the rudder in the air.

Tail surfaces are very small (except the rudder) and even appear inadequate except at high speed. The stabilizer is supported above and below by streamline wires running to the fin and the body termination. All of the tail surfaces are of constant flat section, with no camber or tapering. Although this is not so efficient aerodynamically, it has the advantage of light weight and lends itself to rapid production, easy installation and repair.

The deep cockpit is as commodious as usually associated with larger planes. Leather upholstery around the cowling and a streamline head-rest are provided for the comfort of the pilot.

The plane has a high speed of about 100 miles an hour and carries fuel for a flight of 250 miles. Its total weight is 350 pounds without pilot and it can carry a useful load of 230 pounds. Its landing speed is about 30 miles an hour.

The plane has had but few flight tests and its exhibition to the public was a last-minute decision on the part of the Ford officials who have for years successfully predicted the desires of the traveling public. At the conclusion of the exhibition, the plane was shipped back to Detroit where it will be given further tests in the air and the engine will be experimented with more thoroughly.

AERO DIGEST

Published Monthly
THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
220 WEST 42nd STREET
NEW YORK

Vol. 10 FEBRUARY, 1927 No. 2

WHO IS "LOONEY" NOW?

THE Wright brothers dreamed a dream and made it a reality, thus setting a good precedent.

Down in Washington, a year ago, everybody who was patriotically impelled dreamed the dream of a real American utilization of the Wright brothers' invention.

The President, with fine energy, appointed his Aircraft Board and the five-year program was mapped out; during the very hot days of last summer it was approved by Congress. Great! H-o-o-ray! Uncle Sam was getting up into the air! So Congress adjourned leaving it to the Army and the Navy to work out details.

Everyone in Washington seemed to believe the five-year program to be a real beginning. Programs are supposed to be preliminary to performance.

But——when Congress convened in the early part of December certain members of the House Military Affairs Committee who were interested in the advancement of the five-year program were anxious to find out just how much work had been done during their absence.

They decided the best way was to ask the Secretary of War, the Chief of the General Staff, the Assistant Secretary of War for Air and the Chief of the Air Service. They should know—it was their work. So Secretary of War Davis, Major General Fox Conner, Secretary Davison and General Patrick all appeared by request before a series of Committee hearings, beginning January 5th, with the Hon. W. Frank James of Michigan presiding at the sessions. This——especially James——was all to the good.

If there is one Congressman in Washington working for the real interest of aviation, it is W. Frank James, and we hereby beg his district to keep him on the job forever and forever. He is a Good Sign in Washington—a White Hope—the Real Thing.

The Secretary of War gave a history of the Army appropriations-estimates for 1928, and, when he finished, his right-arm, General Conner, backed up all that he had said and added a few things which apparently had been forgotten by the Secretary. Real information was obtained about everything except the progress of the five-year program—that indeed is the Washington way—habit—nay, system.

The General Staff of course looked first to its own funds, and took up the air program only after these were assured. Certain older and to the Indian fighter more comprehensible and comfortable activities needed bales of money. Air development? Well, it scares the present old time sailor and soldier worse than the Roosevelt horse back riding scared in his day those fighters who had grown too fat. So naturally the nation's air interests were of secondary importance.

You see the five-year program was an orphan child. It was a good looking baby, but it was in the way. Obviously the thing to do was to hurrah about it in the public press, but to see that it was absent when appropriations were passed out.

So when the finance officers from the Army finished with the budget the air appropriation was $6,500,000 less than asked for and needed.

This was not in accordance with the findings of the President's Aircraft Board, nor with the Act of the 69th Congress, nor with the expectations of those interested in building up the industry in the United States, nor with the hopes and wishes of the people as a whole.

When Secretary Davison took the stand Congressmen James, Vinson, Frothingham, Wainwright and others, insisted on getting some real facts.

Chairman James asked Mr. Davison: "Has enough money been allowed so that every flyer will have enough hours in the air next year to keep himself efficient?"

Mr. Davison's answer was: "Yes, sir."

Congressman James had been watching the Reserve situation quite closely, so he probed a little deeper, asking Mr. Davison: "If not, how much more do you want?"

Mr. Davison confirmed his first reply by saying: "The Budget has authorized sufficient for next year."

Mr. James: "Now, the Air Service have been coming around here for years and telling us that they have been starved by the other branches of the service, and we sympathized with them and we passed this five-year program so that they could sit around the table with the rest of them. Now, if you are being starved, we want to know it, and if you are starved with your own consent, we want to know that. If somebody is trying to keep you from having what you ought to have, we want to know it, and we want to know the details. . . ."

Mr. James had asked the Assistant Secretary to submit a report on the Reserve flying situation and in examining it he found that in 1925 the Reserves had 28,109 hours in the air, in 1926 27,851 hours, in 1927 17,269—and that the 1928 estimate only provided for 12,600, a reduction of approximately 5,000 hours.

At this point Mr. Frothingham, of Massachusetts, interjected: "You spoke of the Reserve. There is not enough gasoline to give to the Reserves to enable them to fly the remainder of the year, is there?"

Mr. Davison: "No, sir. Generally speaking, the situation is this so far as the Reserve flying is concerned: at least half, and I think a little more than half, of the funds for the fiscal year 1927, for the Reserve flying, was exhausted at the end of the first quarter; and in this fiscal year, in some of the Corps Areas the Reserve flying has practically ceased and cannot be resumed until the beginning of the next fiscal year."

Mr. Frothingham: "Whose fault is that?"

Mr. Davison: "The funds have run out."

Mr. Garrett: "How much have you been reduced in dollars and cents?"

Mr. Davison: "The amount asked for was $714,000; and the amount allowed in the estimate is $318,226."

Mr. Garrett: "They cut you $400,000 on that flying?"

Mr. Davison: "We submitted the estimate of $714,000, and the amount allowed was $318,000."

Mr. Garrett: "That gives the Reserve flyers about three hours a month instead of six."

Mr. Wainwright: "How many hours did they fly in 1926?"

Mr. Davison: "Twenty-seven thousand."

Mr. Vinson: "Who asked for this 12,000 hours?"

Mr. Davison: "The Reserve officer in charge of estimates for the Reserve Corps."

Mr. Vinson: "He asked the War Department for 12,000 hours and got it?"

Mr. Davison: "Yes, sir."

Mr. Vinson: "If there is any fault, then, it lies in your not having asked enough."

So now we know.

And we also know that such a situation is all wrong.

(Continued on page 160)

A NOD AND A WINK

At the Gnus

By

Cy Caldwell

THE gnuspapers report that some inquiring bozo has dug up the information that eight pilots lost their lives in commercial aviation last year, while eighty persons were kicked to death by mules in Missouri. Hence, said bozo deduces, flying is safer than playing around the business end of a mule.

Perhaps it is, but the above doesn't prove it to me. All I get out of that item is that eighty people in Missouri were too slow to get away from a mule, which doesn't surprise me, for I have been in Missouri. Take these same eighty, while they were yet in the partly living condition peculiar to Missourians, and put them on Broadway at Times Square and we'd have knocked the lot off with taxicabs in eight minutes at the outside. It wouldn't have taken us a year to eliminate them, or I don't know New York and Missouri. No, if you're going to prove to the people that flying is safe you want to get some better example than that.

SPEAKING of mules, I see where the Prince of Wales, scion of our Long Island social set, has fallen off his horse again, spraining his wrist and smashing his wrist watch. If they don't keep that lad off a horse they're going to be short a runner-up for the title of King, which would be a pity, for he's a great little guy and if he makes the grade will reflect some credit on the king business, which has been running steadily down hill for some time. Albert of Belgium is the only one who seems to stack up as a real ruler. The rest of them are about on a level with our congressmen.

But this young Eddie started out with the handicap of being a Prince, overcame it, and proved that he was a regular fellow, able to sit up nights and take his likker like the rest of us. So I'm all in favor of keeping him with us, for after all the king idea has something in its favor. You get hold of one of these kings and just stick him on a throne and then go about your business and pay no attention to him. And he comes in handy laying corner stones and serves as a goal for aspiring Americans to reach. All our American social crawlers go over to England with the ambition of kissing the king's hand. Remove the king and you spoil their whole London season. So we got to keep Eddie with us.

And here's where aviation comes into the business of conserving royalty. Lieut. Freri of the Italian aviation forces, seeing that something would have to be done to ease Eddie off his horse if he can't stay on it, has invented a pocket-sized parachute that will let a man down safely from any height.

A GNUS item from the God-fearing and Ku Klux Klan-fearing town of Indianapolis reports that a young lady typist has taken up aviation as a hobby, and has already had six hours in the air. With this long experience to her credit she is writing a primer for all civilian beginner aviators, she says.

I am sure that it will prove very, very helpful to all us struggling amateurs. The President's Aircraft Board, which hadn't done as much flying as this young lady, also got out a primer which they called their report. It was a very helpful thing, and if that Board had only had the assistance of this girl, with all her hours of actual air experience. I am sure that their report would have been at least twice as helpful as it was. They were just a mite handicapped by the fact that most of them had never been up in an airplane. However, their primer was read by Congress, which hadn't been up either, so it went big.

This girl expects to take the examination of the National Aeronautic Association next spring and qualify as a regular licensed pilot. She is pretty and 21, says the gnuspaper, so I have no doubt that she will pass. I know she would pass if I was the examiner, no matter what my wife thought about her ability; for I am convinced that what pilots lack is beauty. We need more beautiful pilots (see page 100) and I would do my part to help any pretty lady pilot to get her license, especially if she was writing a book on flying.

And speaking of licensed pilots reminds me to warn my six devoted readers that this N A A pilot's license means considerably less than nothing. It does not necessarily mean that the man holding it is qualified to pilot you safely through the air, or that he is healthy and not suffering from heart trouble; he may be an experienced pilot, and he may be as healthy as a cross-channel swimmer. But the N A A license does not guarantee that. It guarantees only that the pilot has flown a figure eight in the air and has landed with dead motor from a height. It does not mean that he has had many hours' experience in the air or that he has a sound heart and good eyesight and firm nerves. No physical examination is necessary to get this kid license in the flying business; no long air experience is necessary. I regard it as simply a piece of cardboard bound in leather, with no meaning to it.

I have one of the things which I got three years ago so I could enter a race sponsored by the N A A. I don't value it. It doesn't mean that I can fly safely or that I'm not apt to keel over with disordered brain while I am flying you along a mile above the earth. I have two other licenses, one issued in England, the other in Canada, which I got only after a rigid physical examination and after much air experience; they mean something. The N A A absurdity does not.

I write thus harshly about this thing to warn my six trusting readers that all who have such licenses are not necessarily safe pilots. The passengers who have been killed in this country have most of them been killed while flying with inexperienced pilots or with experienced pilots who have got out of practice. The N A A license does not guarantee that the pilot is experienced, or healthy. It merely certifies that the man has done some flying.

A pilot's license with a meaning behind it is the one issued by the Department of Commerce, Aeronautics Branch, under the Air Commerce Regulations. The physical and flying qualifications needed to get that license means that the man can really fly and is in good health. If you fly with a pilot holding that license you fly with a man who has had at least the minimum of flying experience which the Department considers is necessary before a man may carry passengers with an assurance of safety. This license is being issued now to pilots who can qualify, and it will take some time to examine all the men who will want them. But by July 1, this year, any who want the license and are entitled to it will have been

(Continued on page 148)

THE TRAVEL AIR MONOPLANE

TRAVEL AIR'S entry in the monoplane field was occasioned by a request from the National Air Transport, Inc. for bids and a definite demonstration on a plane which would carry 1000 pounds load, have a cargo space of 100 cubic feet or more and cruise 105 to 110 miles per hour with a Wright J-4 engine.

Not having a ship to meet all of these requirements Travel Air set about to design and build one, although tests were to be flown just sixty-two days after the request was received.

Drawings were made, and thirty-eight days later the finished monoplane was test-flown and delivered to the Chief Pilot of N A T for comparison with other competing makes.

The result of the comparative tests was a contract from N A T for a number of these new Travel Air models and parts, and work on this contract is progressing rapidly.

Besides the excellent performance, unusual comfort and visibility are outstanding features of the new ship. as well as the fact that it maintains altitude and balance indefinitely when motor is running, without aid from the pilot. In fact, the pilot need not even remain in his seat on sustained flight.

The new plane was flown from the Travel Air field at Wichita to Kansas City for testing through a fog so dense that the mail planes in that territory stayed down because of limited vision. The ability to fly in any weather is valuable for pilots who must at times fly "blind" through fog or darkness.

Completely enclosed, the cockpit is heated so that special togs are not necessary, which is also true of the 4-passenger cabin.

Shortly after the N A T contract was placed, other air mail companies placed tentative orders for similar ships, which were declined owing to the limited production facilities at this time. Additional temporary quarters have been procured for use during the execution of the N A T contract, which are to be completed by May 15th, 1927.

Architects' plans have been approved for a new factory and general office building which is believed will be the largest factory in the country devoted exclusively to the production of commercial airplanes. Construction will begin soon, the location being the Wichita Airport.

The initial test of the Travel Air 5-place cabin monoplane was made with no wind whatever. Carrying a load consisting of pilot, 150 pounds; 4 passengers, 728 pounds; and 60 gallons of gasoline, the plane took off in 12 seconds; climbed 800 feet in one minute; attained a high speed of 125 m.p.h.; cruising speed, at 1600 r.p.m., 104.9 m.p.h.

The following day another test was run with a 10-mile wind blowing. Besides the pilot (150 pounds) and 60 gallons of gasoline, the passenger load was 1100 pounds. The take-off was in 13 seconds against the breeze. The climb and speed were practically the same as on the initial test.

It has a quick take-off with full load, and because of its having individual wheel brakes it will land and come to a complete stop in small fields, as well as turn in a very short radius without assistance. This permits of absolute one-man operation. It is equipped with a self-starter.

Its cruising radius is approximately 450 miles.

Its body construction is according to the best practice, complying rigidly with the American Aeronautic Safety Code. This insures long and faithful service under exacting conditions, whether for transporting passengers or full loads of other cargo. Since the economic worth of any airplane is determined by its years of full productive value, this feature alone merits careful consideration.

The new Travel Air five-place cabin monoplane designed for passengers, mail and express.

THE ENTIRE FLEET ON GOODYEARS

Photo shows 36 x 8 Goodyear Airplane Tires on one of the fifty new U. S. Mail Planes constructed by The Douglas Company, Santa Monica, Cal.

WHEN The Douglas Company received an order for fifty new air mail planes, they went right to work. No delay, no hesitancy—for years of patient research and careful engineering had prepared them for this largest non-military order.

One of the first things they did was to call on Goodyear for tires. And week by week, as Douglas sends new ships to the line, you'll find them on Goodyear Tires!

For The Douglas Company was as well-posted on tire equipment as on aircraft engineering and production. They had used Goodyears on the round-the-world cruisers; knew that Goodyear Airplane Tires help to keep schedule, and give long, trouble-free service.

If you pilot airplanes, or build them, you ought to know about Goodyear Tires—how they match the finest engineering and workmanship and assist performance.

Aeronautic Department

THE GOODYEAR TIRE & RUBBER COMPANY, INC., AKRON, OHIO

GOODYEAR

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AIRPLANE TIRES

VIEWS ON THE AIR REGULATIONS

C. S. Jones, *vice-president, Curtiss Flying Service, Inc., Garden City, L. I., N. Y.:* "The writer has gone over the new aircraft regulations very carefully and in the main believes that the Department, Mr. MacCracken and his assistants, should be highly complimented on their endeavor to incorporate in these first regulations a set of rules which will not too greatly limit the industry and at the same time will take care of the things that need regulating.

"There are a few things which the writer questions: First, according to the regulations, an airplane registered under the approved type of certificate, even with the manufacturer's affidavit, has to be flight tested and inspected by an inspector from the Department. I believe that most airplane manufacturers will welcome such tests provided such requirement does not hold up production. This matter has been brought to the attention of the Department and it is pretty generally understood that should the machinery of the Inspection Department fail to such an extent as to delay the actual delivery of airplanes because of this inspection, some other arrangement will be made. I believe that with this understanding this inspection is satisfactory, but if the system falls down it should certainly be changed as it would be bound to work considerable hardship on a manufacturer and on the customer who is waiting for delivery of a plane.

"It also seems rather unnecessary to require a transport pilot to renew his license every six months. The regulation may be put in because of the question of physical condition, but it is questionable whether six months between physical examinations would do any more good than to have such examinations yearly. It seems that such a requirement works considerable hardship on the pilot and this should not be required unless it is absolutely necessary.

"With these two exceptions the requirements seem to me to be extremely workable and while unquestionably lots of minor questions will arise as the rules are put into effect they certainly give us a definite basis to start with, and if the Department succeeds in getting the high class of inspectors they are striving to obtain there should be no serious difficulty between the Department and the industry in enforcing these regulations to the great benefit of all concerned."

J. Don Alexander, *president, Alexander Aircraft Co., Denver, Colo.:* "I feel that a great step has been accomplished and that as a starter a very reasonable set of rules has been put into effect.

"We are going to coöperate heartily with the department and if all others do the same all will be lovely."

Walter M. Beech, *vice-president and general manager, Travel Air Mfg. Co., Wichita, Kansas:* "The writer feels that they are very complete and of much benefit to the aeronautical industry, due to the fact that the ordinary laboring man as well as the financier can readily see that there are steps taken for his complete safety.

"We believe this will have a great influence upon capital backing the aeronautical industry and will emphasize the larger use of aircraft."

J. E. Hart, *general manager, Klamath Air Service Co., Klamath Falls, Ore.:* "They seem to be fair to all, strict enough for a start, easily defined and if properly enforced will undoubtedly mean 'bigger and better' aviation sooner or later, which is a better vision than most of us have had in the past few years. Therefore my sincere best wishes to Mr. MacCracken."

B. F. Billings, *manager of operations, The Boston Airport Corp., E. Boston, Mass.:* "The new regulations can in no way harm commercial aviation and I sincerely believe that they will stimulate activity and development because of the greater confidence of the public, instilled by the inspection and licensing of planes, pilots and mechanics. This will hold true especially among bankers and business men who have been more or less slow in furnishing the necessary financial aid needed to develop air lines, factories, and such. The Air Commerce Regulations in my mind were drawn up by men that always kept in mind the fact that too much regulation might prove worse than not enough."

George A. Wies, *Geo. A. Wies, Inc., Mineola, N. Y.:* "The new air laws under the Air Commerce Act represent the greatest advance yet made in commercial aeronautics, in this country.

"The fact that we now have the laws is already making an increase in business for those of us interested in the sale and operation of aircraft and many people who looked upon aviation as unstable and undeveloped are beginning to regard it as an important industry.

"Regarding the laws themselves, the writer has yet to find anyone who has anything but a favorable comment to make on them. In their drafting great consideration was given to everyone concerned and the resulting laws should prove more than satisfactory to all.

"That everyone in commercial aeronautics will benefit by the laws is certain."

W. A. Yackey, Jr., *manager and chief pilot, Yackey Aircraft Co., Forest Park, Ill.:* "The regulations are elastic enough to permit no hardships, and yet encourage and regulate commercial aircraft, if properly enforced and amended as they undoubtedly will be by the present Asst. Sec'y MacCracken.

"It is hoped that all the states will pass the same laws and enforce them in the states, as the Department of Commerce will in interstate use of aircraft. This will relieve the airdrome operator of the expense and responsibility of inspecting the aircraft and operators using his airdrome.

"It should encourage the insurance companies to reduce the rates.

"Registered planes and pilots will, undoubtedly, have more prestige with responsible firms and people.

"The maintenance of log books and regular inspection will eliminate the expense of personally inspecting planes and motors before buying and selling.

"Undoubtedly the law will be amended to more specifically classify pilots and planes, i. e. transport pilots could be graded A-B-C-D-and E, according to experience and ability; and classification of worthiness of aircraft graded similarly.

"One of the best examples of the help we have received from the Air Commerce Act is that government fields and facilities can be used in an emergency.

"I honestly believe that commercial aviation is greatly aided by the regulations and will progress much more rapidly."

Richard H. Depew, Jr., *vice-president, Fairchild Flying Corp., New York, N. Y.:* "As Secretary of the Special Committee of the Aeronautical Chamber of Commerce appointed to study the proposed Air Commerce Regulations it was my privilege, together with the other committee members headed by C. S. Jones, to coöperate with Secretary MacCracken in drafting up in final form the regulations as finally promulgated. In the course of this work numerous conferences were attended in Washington and in New York, and I am very glad to have this opportunity of paying a tribute to Secretary MacCracken and his staff for the splendid spirit of coöperation and understanding which they have at all times manifested toward all engaged in civil aviation.

"For a long time I have believed that the proper application of a suitable set of regulations would be a benefit rather than a hindrance to the growth of commercial aeronautics. In the regulations as now put forth I believe we have something reasonable and practical—something constructive rather than restrictive—and I have the utmost confidence that Secretary MacCracken and his staff will administer the regulations properly.

(*Continued on page 102*)

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(*Continued from page 100*)

M. M. MERRILL, *manager, Curtiss Flying Service, Inc., Garden City, L. I., N. Y.:* "When you stop to consider the future of commercial aerial transportation it is folly to think of it as a success without an organization of some kind with a responsible and capable man at its head.

"It is my opinion that Mr. William P. MacCracken, Jr., and his associates have been very fair and liberal in drafting these regulations presented.

"If every man interested in aviation will coöperate in every way possible with the Department of Commerce I think we will find these rules and regulations to be the foundation upon which a great transportation system will eventually be realized."

W. J. BARROWS, *Ryan Airport, San Diego, Calif.:* "I believe that they are fair to both owner and pilot and doubly fair to the public.

"Such a set of laws and regulations can best be criticized only after it has actually been in operation for some time. Therefore, in my opinion, it is imperative that owners and pilots forget their criticisms and coöperate in putting the regulations into effect. If all coöperate, the criticisms needed will show themselves.

"A pilot should welcome the new regulations because they give the experienced commercial pilot the sole right to hire out as a first class man, cutting out cheap inexperienced, competitive piloting. It also assures the pilots that the equipment they fly must be in good condition. It also obviates the necessity of a pilot jeopardizing his job by insisting on good equipment as has often been the case.

"From the owner's viewpoint, the regulations will prove a boon because the owner will be sure of obtaining good pilots and can safely afford to provide better and more expensive equipment, due to the lesser chances of damage due to poor pilotage. The good owner or operator will also find that poor, cheap competition will be weeded out.

"The public at large should welcome the regulations because they mean safer and more reliable transportation for them, and a greater freedom from property damage.

"If all parties concerned will coöperate and give the new laws and regulations a chance to work out, I am sure that we should enjoy a prosperous growth of commercial aviation in the future, and we will all be owing Mr. MacCracken and his associates our heartiest thanks for their hard work in putting over these new air regulations."

VICTOR "SPEED" JOHNSON, *Victor "Speed" Johnson's Flying School, San Mateo, Calif.:* "The new air rules are fine and dandy as well as I can make out. I sure do wish they would live up to them in every way."

TED MOSELY, *test pilot, Eberhart Aeroplane & Motor Co., Buffalo, N. Y.:* "There will probably never be a set of rules and regulations that will suit us all. This is something new, and I am sure that time will thrash out any complications which may arise. Most any rule is better than none.

"It seems to me that the structural strength requirements of aircraft might be a bit too stiff and qualifications of pilots, especially transport, are entirely too lenient.

"To make private ownership of small aircraft popular, the price of small three-place jobs must not exceed $3,000. These machines will not be used commercially to a great extent, and do not require the structural strength of larger long distance passenger planes. With the passing of the OX-5, manufacturers will have to go some to keep up to specifications, using a modern motor, and keep the price within the $3,000 limit.

"I think anyone who has their first papers should be allowed to operate aircraft.

"At least one hose connection should be between the main tank and the carburetor to eliminate all possible vibration of the gas lines.

"A professional transport pilot should have at least 300 hours, including five hours of night flying, and by all means be twenty-one years of age. Fair weather pilots and minors keep out. How many would trust their sisters and mothers on a long journey with some eighteen-year old boy wonder with 100 hours. A transport pilot with whom passengers trust their very lives, should be a seasoned veteran of several years' experience, and must have flown in all kinds of adverse weather conditions. You don't get seasoned flying 100 hours and your good judgement and horse sense usually starts about twenty-one years of age. Exceptions, of course. Let me offer an example. Mr. X starts an air line and lets his eighteen-year old son fly the route. If he is licensed, it is legal, but it don't sound right to me."

FRED D. HOYT, *vice-president and treasurer, and* LLOYD STEARMAN, *president, Stearman Aircraft, Inc., Venice, Calif.:* "We are both of the opinion that the new air regulations meet all of the requirements for the present. They seem just and fair to everyone concerned.

"We feel that companies or individuals who cannot live up to them should be 'weeded out.' It is our opinion that the regulations properly enforced will not only help us in the matter of insurance but will inspire the confidence of the 'flying public' immeasurably, and as the industry depends largely upon their confidence we both believe that the establishment of the new air regulations is a very progressive step fully as important as any one item since the beginning of the game."

WALDO D. WATERMAN, *president, Professional Pilots Association, Ontario, Calif.:* "The final draft of the air regulations has entirely eliminated most of the objectionable features of the original. Certainly it would be impossible to draw up a set of regulations that would satisfy everyone and cover all conditions. The aircraft industry is indeed fortunate to have a man like Bill MacCracken in the position, who will listen to the representatives of the industry and be governed accordingly. He seems never to have lost sight of the fact that the Air Commerce Act of 1926 was passed '—to foster and promote Commercial Aviation.' Every step taken so far is indicative of a desire to do just this.

"There is much that one might take issue with, and a great deal more that can be praised in these regulations. Taken as a whole, they are well worked up, and, properly administered, will certainly fulfill their purpose."

ALLEN S. PATTERSON, *Rogers Airport, Los Angeles, Calif.:* "I have heard pros and cons on different sections of the code. Some say this or that section should be amended. Well, maybe they should and maybe they shouldn't. My frank opinion is: let the bird grow some feathers before clipping its wings. As it is specifically stated, such amendments will be made as the necessity arises, so I do not think that any of you boys should worry (Bill has done all that is necessary) about a few sections here or there that may not exactly suit your peculiar way of thinking about them.

"We have hollered for these laws for years; we have said that when we got them, they would work wonders for this old game of ours. Now we have 'em and I do not think that there ever could be duplicated a set of laws or regulations more comprehensive in their meaning and execution than those laid down for us by Mr. MacCracken. One little realizes the amount of research, labor and discouragement that must have been a part of the great task of compiling that code, a task that is up to all of us to help crown with success.

"Maybe this manufacturer or that manufacturer won't like the loading specifications for his aileron or flipper, or maybe he doesn't want to drop his 2,500-pound airplane 24 inches to see if he has made any mistakes in his landing gear calculations. Perhaps Bill was thinking of some of those 50-foot landings that are occasionally made by the best of us. And boys, he didn't say to throw away your Jennies—we will still be able to keep them in the green pastures to which they are accustomed instead of a corral as I had visioned.

"I feel that every man, be he engaged in the Army, Navy or commercial branches of aviation, should put forth every effort to show their appreciation and gratitude for the work done by our Air Secretary."

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THE HOME OF THE EAGLEROCK

THERE are among AERO DIGEST'S readers many who have visited the Alexander Aircraft Company, have seen the home of the Eaglerock in Denver and are acquainted with at least one member of what is believed to be the largest airplane sales force in the world; the fourteen dealers having exclusive sales territories in different parts of the country are Eaglerock owners and operate under contract with the Alexander Aircraft Company. No consideration is taken of the number of sub-dealers or representatives who work under their local dealer.

Within the past year the company pioneered the time payment plan of selling airplanes, making it possible for fliers of moderate means to obtain for themselves one of the best of the new production jobs. They instituted the Municipal Flying Club plan whereby its members through joint effort and group financing may obtain ships for their use and an opportunity to learn the game at low cost. Through a nation-wide publicity campaign they have promoted lowered cost for student instruction and passenger flights, working on a sound theory that the increased volume of business, which naturally follows lowered charges, increases profits and promotes aviation to the public in general. for the good of all.

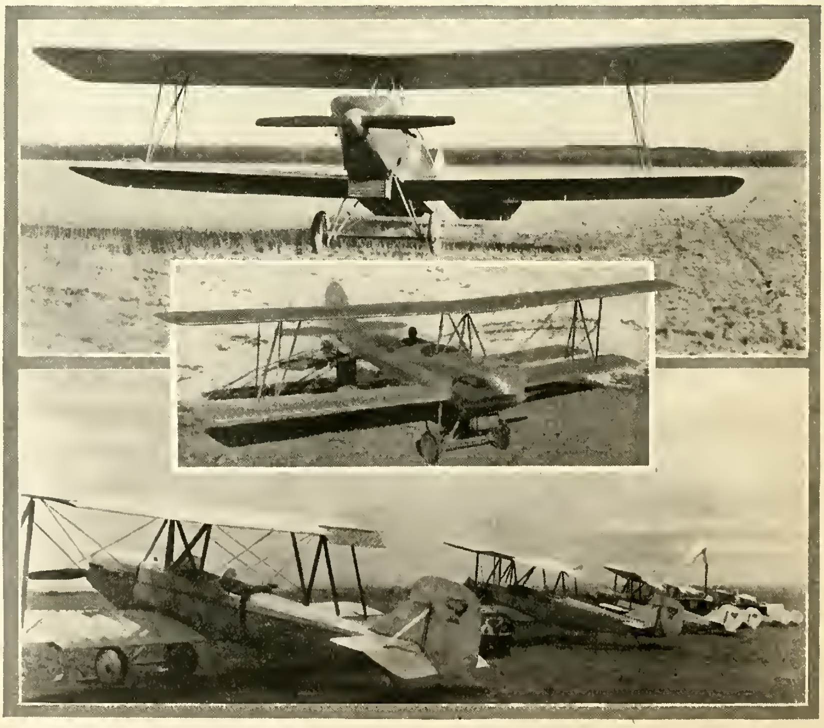
They are now engaged in placing a booster for aviation in every city and hamlet in the country. Their idea, called the "sub-dealer and representative plan," will enable young men now employed to obtain a commission on planes which they sell or help sell through their local dealer or from the students they are able to direct to his flying field. In the employment files of the Alexander Aircraft Company are at present over four hundred applications sent in by young men from every corner of the country for an opportunity—any kind of an opportunity—to enter the game. The sub-dealer and representative plan will provide just such an opportunity.

Alexander Industries, Incorporated, parent organization of the Alexander Aircraft Company, is located on nearly one full city block close to the city of Denver, Colorado. Its activities occupy the time of over 200 employees and of this number there are 64 engaged at present in constructing and distributing the three Eaglerock planes manufactured weekly.

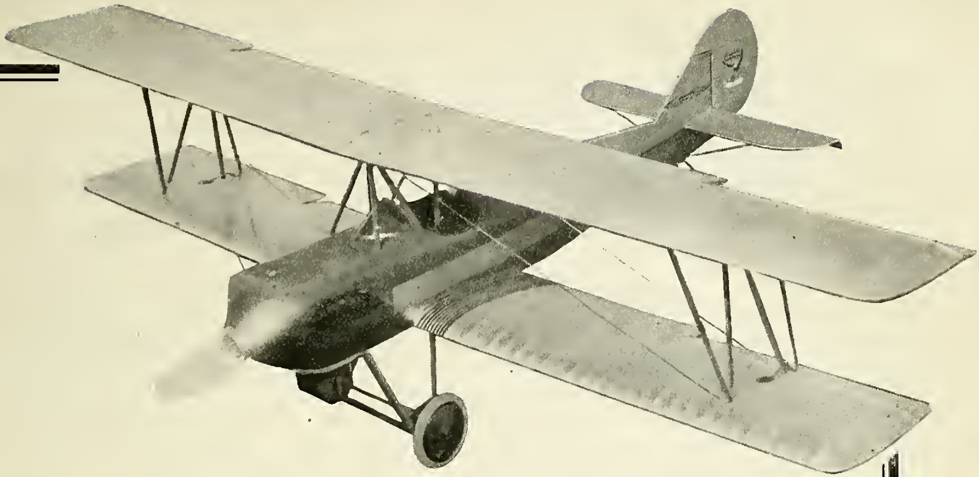
Two factory units which up to a short time ago housed all construction activities have been inadequate to care for the ever increasing demand for this three-place, light commercial ship. A new unit of fifty-seven hundred feet floor space is under construction and a fourth unit is planned for early spring. These buildings are equipped with modern machinery and manned by men highly skilled in the art of aircraft construction.

Alexander Airport is a mile by a mile and a half strip of fine, level land located a few miles east of the factory. A new hangar which houses three fully rigged ships has

(*Cont. on p. 111*)



Three Alexander Eaglerock airplanes are now being produced each week.



for the Big Year —

ALEXANDER EAGLEROCK

There is in an Eaglerock a high margin of safety attained through ruggedness of construction without the sacrifice of performance for weight. It is conceded to have the best stream lined fuselage in existence, ease of control ample lateral control in any position, a quick take off, slow landing, maneuverability under any condition and ability to perform at a mile high altitude with full load. The ship is built with your choice of long wings for high altitude or combination wings for low. You have but to review our performance records of the past year, our organized service to customers, our nominal charge for replacements and our responsponsibility as rated in Bradstreets and Dunn's to understand the present popularity for the Alexander Eaglerocks

Cash
$2475
Denver

ALEXANDER AIRCRAFT CO.
ROOM 402
ALEXANDER INDUSTRIES BLDG.
DENVER, COLORADO

Our dealers have been selected carefully because of their experience and reliability. Each conducts a flying school at his respective airport where students are taught in easily learned Eaglerocks. As each student is a prospective future buyer of a ship, personal attention is given him at an unusually low rate for instruction.

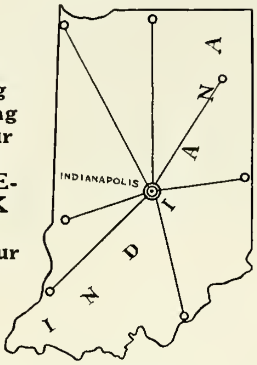
EAGLEROCK DEALERS WITH DEMONSTRATOR SHIPS:

New York and Connecticut—T. D. S. Aerial Service, Inc., 25 W. 23d St., New York City, New York
Okla. and Texas Panhandle—Southwest Airplane Sales Corp., Okla. City, Oklahoma
W. Missouri and E. Kansas—Bennett Eaglerock Sales Co., Kansas City, Missouri
E. Missouri and Arkansas,—Bridgeton Aircraft Corporation, St. Louis, Missouri
Southern California—Aero Corporation of California, Los Angeles
Indiana—Captain J. A. Yonge, Box 1185, Indianapolis, Indiana
Wyoming and Montana—Wyoming Airways, Casper, Wyoming
Virginia and North Carolina—J. S. Charles, Richmond, Virginia
Southern Texas—Dick Hair, Box 420, San Antonio, Texas
Northern California—W. L. Lamkin, Porterville, California
Western Kansas—C. E. Steele, Dodge City, Kansas
Illinois—Sievert Aircraft Corp., Chicago, Illinois
Michigan—Niles Airways, Niles, Michigan

Performance With Economy

Indiana Headquarters
for the
ALEXANDER EAGLEROCK
will be at the
MUNICIPAL AIRPORT
INDIANAPOLIS

Flying training on your own EAGLE-ROCK $5 per hour



Reasonable rates for training, long and short passenger carrying, aerial photography, etc.

SUB-DEALERS WANTED
for this fast-selling airplane.

For Information Write.
CAPTAIN J. A. YONGE
Alexander Eaglerock Dealer for Indiana.

New address after March 1st:
P. O. Box 1185 Indianapolis, Ind.

CHARLES FLYING SERVICE
Box 44, N. Side Richmond, Virginia

EAGLEROCK
SALES AND SERVICE

FLYING INSTRUCTION
on Alexander Eaglerock airplanes.

AERIAL PHOTOGRAPHY
of long experience. Satisfaction guaranteed.

SERVICE
on all types of airplanes.

CROSS-COUNTRY TRANSPORTATION
at reasonable rates.

ANYTHING IN FLYING

WE CHOSE
ALEXANDER EAGLEROCK
because of its performance and economy

IN addition to commercial flying, Wyoming Airways will continue to operate one of the best schools of Aviation in the Northwest.

Wyoming Airways Flying Field is second to none and is within easy reach of the city of Casper.

Complete service is offered to visiting pilots; oil, gas, water, expert mechanics and riggers.

Eventually there will be placed at the Airport a Municipal hangar. .

Powder River Flying Club—a live organization, composed of Wyoming flyers, headed by Major D. P. Wardwell.

This club was formed a short while ago to take care of the local demand for ships and flying facilities.

We will welcome inquiries and be glad to send information to assist other communities to form similar clubs.

Powder-River — Let'er Buck.

WYOMING AIRWAYS INCORPORATED, CASPER, WYO.

We sell, use and store Eaglerock Airplanes

SIEVERT AIRCRAFT CORPORATION

CHICAGO MUNICIPAL AIRPORT

Eaglerock Dealers
for
Northern Illinois and Southern Wisconsin

Facilities now available for Eaglerock and other airplanes

Concrete Hangar
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Safe Reliable Service
Standard Fuel and Oil
Easy Transportation to City

Eaglerock Flying Clubs now being organized

Also Fokker Distributors for this territory

WRITE FOR DETAILED MAP OF CHICAGO FIELDS

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5934 So. Cicero Ave.
Hemlock 5780
CHICAGO

LEARN TO FLY at RICHARD'S FIELD

(used by Army and Air Mail)

Using new Eaglerock Airplanes

COMPLETE FLYING COURSE
15 HOURS $200

We guarantee you to Solo

The last 5 hours of this course are devoted to cross country flying and map reading when we teach:

How to select a landing field from the air
The fields that make good landing fields and the ones to avoid
Forced landings, what to do and the field to select
How to locate and correct motor trouble
Wind and clouds, what they mean to the Aviator

Every student taught individually, no classes. Enroll today and be assigned to your private instructor. 4 instructors—no waiting.

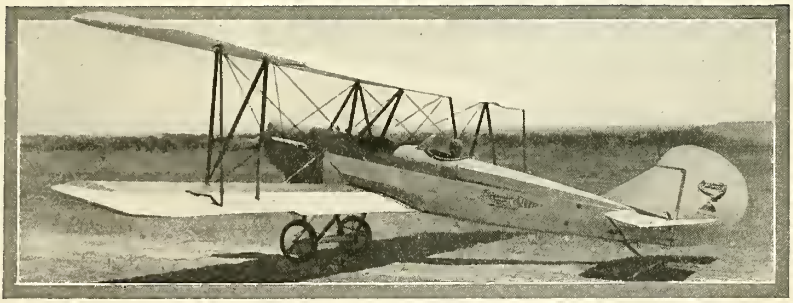
Bennett Eaglerock Sales Co.

Eaglerock dealers Western Mo. and Eastern Kansas
223 West 12th Street, Kansas City, Mo.
Used planes for sale. We trade new planes for old ones.

IN NEW YORK AND CONNECTICUT

we sell the

ALEXANDER EAGLEROCK



We give flying instruction patterned after the Alexander low-price plan.

Commercial work of every description

Have you heard about our Flying Club? It gives you frequent flights at very low cost!

T. D. S. AERIAL SERVICE, Inc.

35 West 23d St., New York, N. Y. *Phone—Gramercy 5299*

G. TORLOTTING F. W. DALRYMPLE R. G. SHULTS

WANTED

—ten owner-pilots to co-operate in the sale of ALEXANDER EAGLEROCK *airplanes in the coast territory between Bakersfield and the Oregon state line*

For details write

W. L. LAMKIN

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EXCLUSIVE NORTHERN CALIFORNIA DEALER

ALEXANDER EAGLEROCK

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INVESTIGATE

ECKLES VALVE ACTION ASSEMBLY FOR CURTISS OX5 MOTORS

Increased Dependability—
Increased Motor Efficiency—
Lower Cost and Maintenance—
Ball Bearing and Heavy Type Lignite Rocker Arms.

The Aero Corporation of California
10401 S. Western Ave., Los Angeles, Calif.

CLOSING OUT SALE

In the future we will carry only newly manufactured and modern airplane parts, supplies and accessories. We are now discontinuing our line of war surplus materials and selling our entire large stock of JN4D and J1 parts and supplies at sensationally low prices.

WRITE FOR CATALOGUE AND PRICE LIST

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Exhibition Flying
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Located on the outskirts of St. Louis, the St. Louis flying field is one of the largest and best equipped fields in this part of the country.

Our Flying School

under the competent management of veteran instructors provides thorough instruction for the student. We give only complete courses, knowing that no one can become a capable pilot with but a few hours instruction.

Write for particulars.

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DISTRIBUTORS FOR

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Hangar and shops at Municipal Field, Oklahoma City.

Complete shop equipment for servicing and building.

Aviation gas and oils. Service at all times.

Southwest Airplane Sales Corp.

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EAGLEROCK AIRPLANES

are finished with

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NEW PRODUCTION

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Van Schaack Bros. Chemical Works, Inc.

3358 Avondale Avenue
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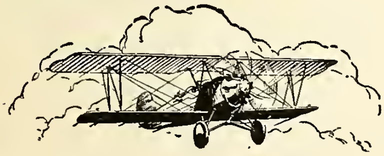
On the "Eaglerock"

MACWHYTE Streamline Tie Rods give 10% greater flying efficiency. Wind resistance is cut to the absolute minimum. We will be glad to tell you the details. Macwhyte Company, 2907 Fourteenth Ave., Kenosha, Wis.



MACWHYTE

Streamline TIE RODS

FLIGHTEX FABRIC

REGISTERED U.S. PAT. OFF.

Style No. 170

A SUPERIOR

"GRADE "A" FABRIC"

for

Aeroplane Construction

Guaranteed to meet
Army and Navy Air Service
Specification for
Grade "A" Mercerized Aeroplane Fabric

The wings, fuselage and tail surfaces of the Alexander Eaglerock are covered with FLIGHTEX fabric.

E. S. TWINING & CO.

320 BROADWAY
NEW YORK

BOYCE MOTO METER
is used on the
ALEXANDER EAGLEROCK

Commercial aircraft operators realize the necessity and economy of an accurate engine temperature gauge.

The Alexander Eaglerock, therefore, is equipped with Boyce Moto Meters.

The MOTO METER CO., Inc.
Industrial Thermometer Division
LONG ISLAND CITY, N. Y.

AEROPLANE SPRUCE

The spars of the Alexander Eaglerock are of Sitka Spruce supplied by

J. V. G. Posey and Co.
1321 Northwestern Bank Building
Portland, Oregon

ROUGH GREEN—ROUGH DRY —SURFACED

CAR LOTS OR LESS

Spruce Specialists Since 1902

EVERYTHING FOR THE AIRPLANE

Motors and parts of all kinds from 28 h. p. to 500 h. p. Propellers, Radiators, Instruments, Wheels, Tires, Shock Cord, Fabric, Turnbuckles, Wire Fittings, Bolts and Nuts.

We also carry a complete line of the best quality Helmets, Goggles and Flying Suits.

Send for our Catalogue

Satisfaction

There is a satisfaction in knowing that when you purchase an article, whether it be a small accessory or a complete airplane, you are dealing with a house that stands behind every sale, and gives you a money-back guarantee, if for any reason you are not satisfied. Such is the enviable reputation established in more than fourteen years, by this company, the oldest Aircraft Supply House in the United States.

CRAWFORD AIRPLANE CO.
"Masters of the Air"
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The
ALEXANDER AIRCRAFT COMPANY
Builders and Operators of
EAGLEROCK AIRPLANES
use the New and Better
TEXACO GASOLINE
and
TEXACO AIRPLANE OIL
—EXCLUSIVELY!

You can obtain the same identical Gasoline and Airplane Oil for *your* ship—at any place where this TEXACO trademark is displayed:—

TEXACO

THE TEXAS COMPANY
Manufacturers of TEXACO Petroleum Products
17 Battery Place, New York City
Offices in Principal Cities.

THE HOME OF THE EAGLEROCK

(Concluded from page 104)

been recently erected and a machine shop installed for the making of repairs. Oil, gas, water and telephone are all available for visiting pilots. Instruction pilots have been busily engaged throughout the winter teaching student flyers who have availed themselves of the moderate climate in Denver.

The Alexander organization is strongly financed, are producing a successful ship, and from all indications at this time, the aviation department of Alexander Industries will meet with an ever-increasing volume of business.

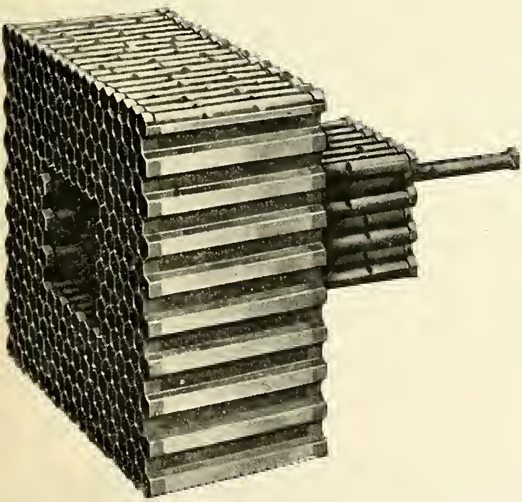
J. A. McInaney, Eaglerock Sales Manager

The Alexander Eaglerock plane is powered with a Curtiss OX5 90 h.p. engine. The wing span is 38 feet. Length, 23 feet 6 inches. Wing area, 350 square feet. Weight empty, 1100 pounds. Useful load, 800 pounds. High speed, 89 m.p.h. Climb in one minute, 600 feet. Ceiling, 17,600 ft.

NICHOLAS-BEAZLEY
AIRPLANE COMPANY
Supplies the
ALEXANDER AIRCRAFT CO.
with OX5 Motors and large quantities of materials, parts and fixtures used in the construction of
THE ALEXANDER EAGLEROCK

All kinds of aircraft materials

WRITE FOR OUR 1927 CATALOGUE
NICHOLAS-BEAZLEY AIRPLANE CO.
MARSHALL, MISSOURI



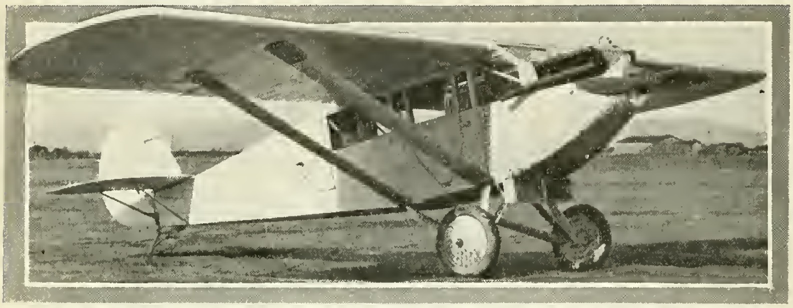
THE Alexander Industries, Inc., manufacturers of the Eaglerock airplane, are using the Cartridge radiator core exclusively for all of their planes. Experience has shown the superiority of the Cartridge core from the standpoint of exceptional cooling efficiency, water flow capacity, ease of repair and ruggedness.

The Cartridge Radiator Core is being specified for U. S. Government planes, and is also widely used by manufacturers of commercial airplanes.

WINCHESTER REPEATING ARMS COMPANY
RADIATOR DIVISION
NEW HAVEN, CONNECTICUT

CARTRIDGE
Radiator Cores

WESTERN NEWS



The new Ryan Brougham, a five-place high speed commercial light transport.

THE RYAN BROUGHAM

ANSWERING the demand for a closed type plane, Ryan Airlines, builders of the Ryan M-1, announce for 1927 the Ryan Brougham, a five-place high speed commercial light transport.

The original demonstrator has for its power plant the Wright E-2 motor which gives this plane the same performance as the Ryan M-1 open model with the Wright J-4. A top speed of over 130 m.p.h., cruising speed just under 115 m.p.h. with a landing speed of 45 m.p.h.

Finished in Saftee-glass throughout, with all of the windows opening including the front ones, the vision for pilot and all of the passengers is excellent. Mr. Ryan tested the first plane after the sun had set, making this first landing in semi-darkness with ease. Pilots who have flown the new model, marvel at its remarkable stability, ease of handling and excellent visibility.

The interior is upholstered in mohair, which tends to shut out the sound of the motor allowing the passengers to carry on a conversation in flight. The large cargo compartment to the rear of the cabin is accessible from both the outside and the inside. It is designed to hold 150 pounds of mail or express.

In other appearances the new Broughams have much the same lines as the popular Ryan M-1 open models, having the same wing spread and fuselage length.

NORTHWEST NEWS

By F. K. Haskell

REORGANIZATION of the old Aero Club of Oregon at Portland has been accomplished and Luther L. Adcox has been named as president, at a dinner given by H. W. Fries. Other officers elected were Tex Rankin, vice president; Don S. Phillips, secretary; Paul Brong, treasurer; Peter Welch, Noel Evans and James Rhinehart, trustees to serve with the president and secretary.

The meeting was addressed by Lieut. Oakley G. Kelly, and Postmaster John M. Jones of Portland. Twenty-seven applied for membership at the first meeting.

FLIGHTS TO HONOLULU

C. K. VANCE, veteran air mail pilot, will endeavor to make a non-stop flight from San Francisco to Honolulu (2,380 miles) next June in a Douglas plane. Financing of the flight has been promised, Vance said by San Francisco and Hawaiian interests.

This will be an effort to carry out as a "sporting proposition" the undertaking of the Navy in the fall of 1925 which failed of full success.

Another non-stop California-Honolulu flight effort is sponsored by the San Diego Chamber of Commerce. Lee Schoenhair, former Rockwell Field Military flyer, will attempt to fly some time in March in a Fokker monoplane from North Island, San Diego to Luke Field, Honolulu.

CAL. AERO CORP. NEWS

By R. A. Edwards

CONSTRUCTION work on the new field of the Aero Corporation of California is under way. A 95 x 35 two-story shop is going up in addition to stock department, lunch stand, warehouse and hangars, together with complete aero service station.

During the past month Eaglerocks have been sold to F. C. Schott and Pete Schang, to take delivery March 20. This makes one carload coming out on that date.

T. C. Alexander flew in the first of the month from Kansas with a combination job Eaglerock—the first one sold by the Aero Corporation. We are now rebuilding his motor in preparation for another extended barn-storming tour.

On January 8, at 12:00 o'clock noon, the company received a call from the Barbara Worth Hotel, El Centro, to rush to the Imperial Airport at Imperial and pick up Nicholas F. Jahn of the Jahn & Bressi Construction Co., who had to reach Los Angeles that afternoon on important business. The round trip of 425 miles in four hours and forty-five minutes was made in the Eaglerock, Jack Frye piloting.

We received a visit from T. C. Brown and Jack Hewson of San Diego during the month, who flew in their new Eaglerock long wing job. They are very enthusiastic in their praises of the ship.

OX5 motors now in the shop are being rebuilt for Pete Schang, Geo. Irvin, Warren O. Kane of Long Beach, F. C. Schott and T. C. Alexander.

New students who were signed up in the past month were: Walter Berry, Travis Bryson, Albert Paszdermik of Huntington Park N. W. Sparkman of Santa Monica, Geo. Yakovler, Henry Barbee, Frank Hammerson, R. E. Compton and Harvey Bolton of Chico, Cal.

BURDETT AIR LINES

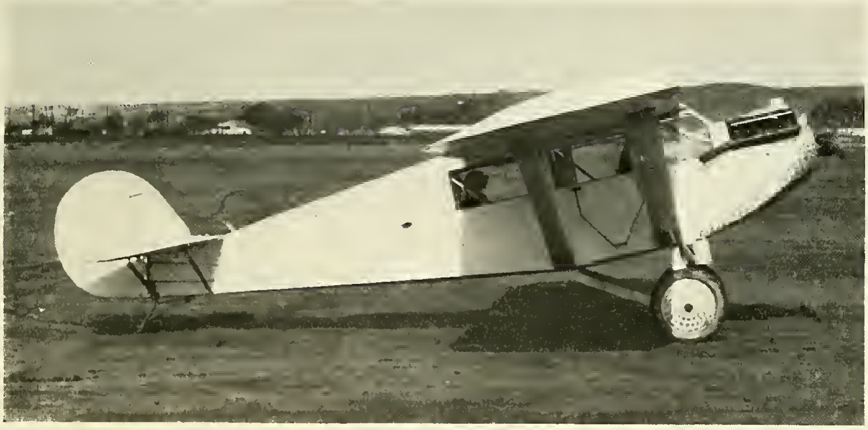
THE Burdett Air Lines, Inc. flying field, located at 94th and Western Ave., comprises 115 acres, is one of the best equipped and well located airports in this section of the country. It is five miles south and one mile west of the heart of Los Angeles; has modern equipment, including gas station, office, shop, hangars, and restaurant. The field has just been rolled, oiled and covered with decomposed granite which makes it smooth, hard and dustless, so that ships can land or take off immediately after the hardest rain. The company is planning to equip their field in the near future with floodlights and radio station.

They also maintain and operate a very efficient school. They have affiliated with the International Aircraft Corporation, builders of commercial airplanes, so as to give their students access in the Corp.'s factory, where they can obtain knowledge and experience in airplane construction.

A view at Burdett Airport showing their new eight-passenger triplane.

The Ryan Brougham

for 1927



A Modern Closed Airplane

destined to predominate the commercial and pleasure plane field as an ideal type.

This Ryan Brougham has undergone a thorough development—the result is a highly modern, carefully designed and constructed closed type monoplane, with perfect vision for Pilot and Passengers.

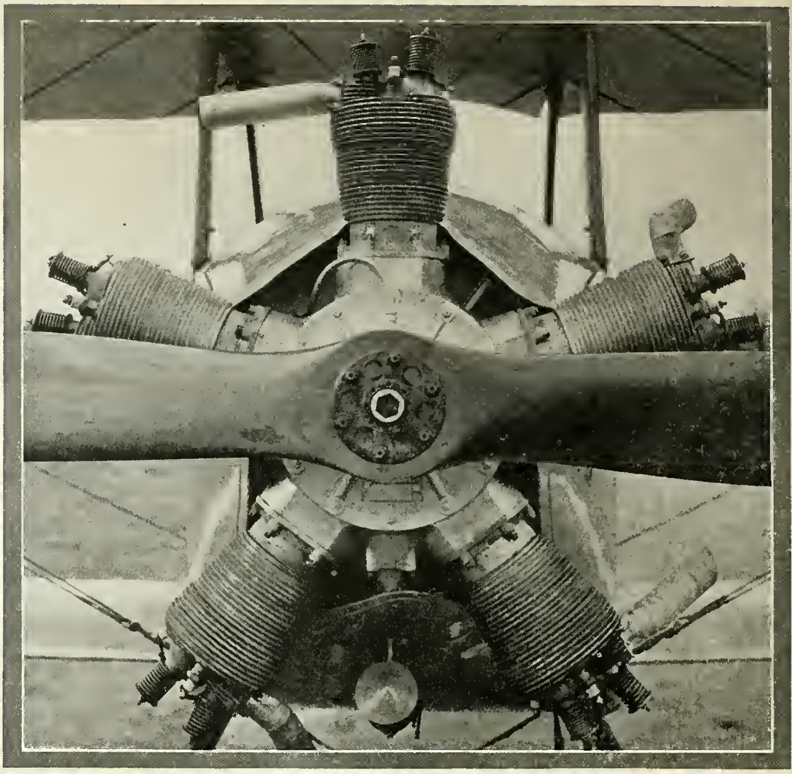
This new Ryan is keeping faith with an airminded public who expect of Ryan "the latest, first."

RYAN AIRLINES

SAN DIEGO

A complete line of open and closed models
in the passenger, mail and express types.

KINNER 100 h.p. MOTOR



The model K-2 air-cooled engine produced by the Kinner Corporation.

THE Kinner Airplane and Motor Corporation of Glendale, California have developed a new aircraft motor which is available to the trade, although produced primarily for use in the new Kinner Airster. This motor, known as model K-2, is a five-cylinder air-cooled radial four cycle engine having a bore of 4¼ inches and stroke of 5¼ inches and developing 100 h.p. at 1,800 r.p.m. at sea level.

Cylinders are cast of aluminum with the cooling fins integral, and with valve seats of bronze cast in the cylinder head. A high grade steel liner is shrunk into the cylinder, furnishing a long life bearing for the piston. This sleeve is held in place by a flange which is machined on the skirt. The cylinder head is provided with two overhead valves, one inlet and one exhaust, operated by rocker arms carried on steel supports screwed into bosses cast on the cylinder. The cylinder is connected to the manifold by an aluminum intake pipe attached to the inlet port by three studs, and to the manifold by a rubber hose and clamp. The exhaust port is also provided with a flange, to which an exhaust pipe may be attached if desired. The cylinders are located 72 degrees apart. Each cylinder, with its valves, push rods, liners and intake pipe, is a separate unit, and can be removed without disturbing the others.

Pistons are made of a special aluminum alloy. Each has three compression and two oil wiper rings, one above and one below the wristpin. The wristpins are hardened and ground. Connecting rods are of the one main rod type and the other four pinned to it, which makes all connections adjustable by simply renewing the pins. The adjustable babbitted cranking bearing is made of bronze.

A single throw crankshaft, with adjustable balance weights, of Kinner's own invention, opposite the crankpin, run in two babbitt-lined main bearings, which take the thrust for either a tractor or pusher type propeller. There is a 700-pound ball thrust bearing to take the thrust when the motor is being used as a tractor. The aluminum crankcase is cylindrical in shape and consists of four parts—a removable front cover with the oil retaining cover, a main case with an integral wall in the rear, and a rear cover which encloses the cam and push rod mechanism, and carries the accessories. The cam mechanism consists of five camshafts, each having an inlet and an exhaust cam. They are driven by a spur gear on the crankshaft, which meshes with the gears on the five camshafts, and which drives them at one-half engine speed. The cam followers are of the roller type. The intake manifold of cast aluminum carries the carburetor; it is fastened to the rear of the crankcase by ten cap screws. The accessories consists of one oil pump, two magnetos, a one-half engine speed tachometer drive and one carburetor.

The propeller hub is mounted on the tapered end of the crankshaft, and is held from turning by a key. The hub is forced on to the taper by a nut which is held from coming off by a special locking device. A hub puller is furnished with each motor.

Two five-cylinder high tension magnetos are provided; each are driven at 1¼ engine speed, having a range of advance and retard of 30 degrees measured on the crankshaft. The spark advance levers of both magnetos are connected with an adjustable rod. The magneto driving gears are adjustable for timing purposes.

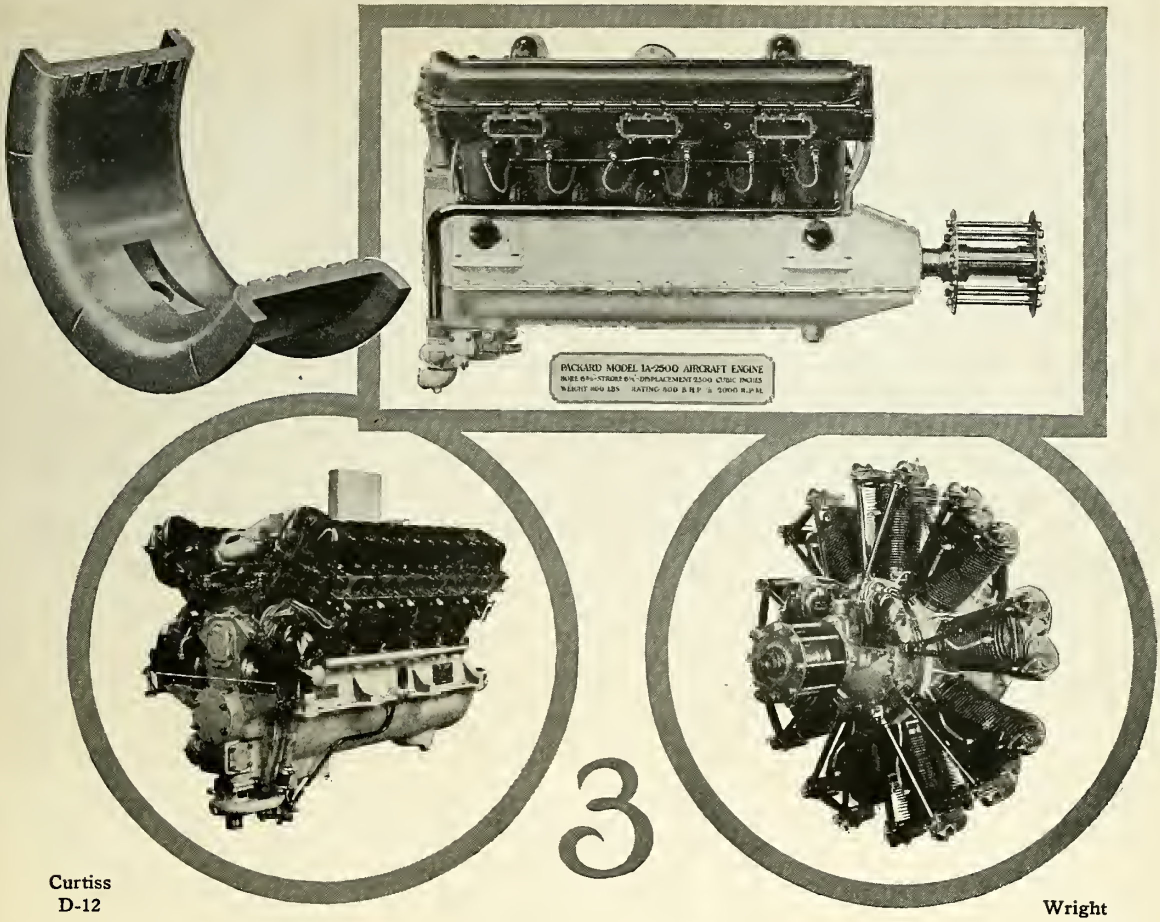
Cylinders complete with valves, valve springs and rocker arms can be easily removed by unscrewing six nuts. Pistons, rings and wristpins can be removed after the cylinders have been removed. The crankpin bearing and connecting rods can be inspected or disassembled by removing the propeller and front end cover. The crankshaft can be inspected or removed without removing the engine from the fuselage. The cam followers, tappets, tappet guides, push rods, magnetos and magneto drive gears can also be disassembled without removing the engine from the plane. The oil pump can be removed from the rear. In order to disassemble the cam drive mechanism, it is not necessary to take the engine out of the plane.

The motor has undergone satisfactory tests both in the shop and in the air. It is now under small production, and it is planned to go under heavy production immediately.

Specifications

Displacement	372 cubic inches
Compression ratio	5 to 1
Brake h.p.	100
Norman engine speed	1800 r.p.m.
Piston speed	1575 feet per min.
Firing order	1-3-5-2-4
Rotation of crankshaft	Anti-clockwise
Max. gas consumption per hour	7 gallons
Maximum oil consumption per hour	2¼ pints
Oil pressure per square inch	30 pounds
Weight complete, including hub	231 pounds

A Kinner K-2 engine installed in the new 2-seater Kinner Airster.


PACKARD MODEL 1A-2500 AIRCRAFT ENGINE
DISPLACEMENT 2500 CUBIC INCHES

Curtiss
D-12

Wright
P-2

3 Great Airplane Engine Manufacturers have accepted Ring True Bearings as Standard

BESIDES supplying BOHN Ring True bronze-back babbitt-lined bearings to most of the manufacturers of automobiles in the country — Ring True bearings have been accepted as standard by these three outstanding aircraft engine manufacturers.

BOHN PRODUCTS include Ring True Bearings, interchangeable and standard type, bronze, babbitt-lined—BOHNALITE castings, both permanent mold and sand—NELSON BOHNALITE Pistons—we also manufacture replacement bearings and pistons for the Liberty Motor.

BOHN ALUMINUM & BRASS CORPORATION

EAST GRAND BOULEVARD, DETROIT

STEARMAN AIRCRAFT

A NEW company, Stearman Aircraft, Inc., has been organized and incorporated under the laws of California, for the purpose of manufacturing aircraft. In addition to their production activities a general flying service and instruction school is to be maintained. The new corporation is the consolidation of the interests of the Lyle-Hoyt Aircraft Corp. with the technical and creative abilities of Lloyd Stearman and Mac Short.

The Lyle-Hoyt Aircraft Corp. was formerly the West Coast distributor for Travel Air with headquarters at Clover Field.

Lloyd Stearman has been prominently connected with the designing and production of commercial aircraft in this country since the inception of the industry. He has designed and personally supervised the production of several of the outstanding commercial planes that have appeared within the last few years. Stearman is president of the organization and has been retained as designer and production manager.

Mac Short is an aeronautical technician of national repute and at the present time is connected with the Aeronautical Dept. of Massachusetts Institute of Technology. In the spring Mr. Short will join the company and will be actively engaged as associate engineer.

Their factory, located at Venice, Calif., has a floor space of 6,000 feet. Their hangars, at Clover Field, will be utilized for final assembly, test flying, and as a local distribution base.

The first ship to be built by the Stearman organization is nearing completion.

B. G. REPRESENTATIVES FOR THE WEST COAST

THE B. G. Corporation, manufacturers of B. G. spark plugs, are now represented on the Pacific Coast by the Pacific Scientific Co., of 639 South San Pedro St., Los Angeles, and 15 Spear St., San Francisco, California. Since the B. G. spark plugs gave such a good account of themselves in the Italian Schneider trophy winner, greater interest than ever is being manifested by the many new manufacturers of commercial craft on the West Coast.

WOODSON AIRPORT

W. N. WOODSON, prominent hotel man of Corning, California, has donated to the town of Corning a 240-acre tract of land one-half mile from town, on which he has erected hangars with housing facilities for four planes, and spacious quarters for shop, office and living rooms of the field personnel of the Klamath Air Service Co., who are the occupants of the field.

The field is graded and properly marked and the runways are now being covered with gravel. A gas pump has been installed and gasoline and oils will be available at all times.

The Klamath Air Service Company, who now operate fields at Klamath Falls, Oregon and Glendale, California, will, together with conducting a school of aviation, establish at Corning a sales and distribution agency for the well known Waterhouse Cruzair and Romair planes and the Bull's Eye Bailey aviation engines.

The field is known as the Woodson Airport and is in charge of J. E. Hart who extends a hearty invitation to all flyers to visit the field while in that part of the country.

MAMER FLYING SERV.

THE Mamer Flying Service, under the management of N. B. Mamer, pioneer commercial aviator of the Pacific Northwest, have recently taken over the distribution of Swallow airplanes for the states of Washington, Idaho, Montana and British Columbia, with headquarters at the Parkwater Flying Field, Spokane, Wash. The first car load of planes arrived from Wichita on February 1, two of which have already been sold. A second carload has been ordered and is expected to arrive about the first of March.

Mr. Mamer has been established at Spokane for the past seven years and is well known throughout the west as a commercial and forest patrol pilot.

The company operates a flying school using Swallow airplanes, and offers to the public a flying service and air passenger taxi service available at all times. Hangar repair and service facilities are maintained at the field. Fifteen students have thus far been enrolled and things are humming around the airport.

NEW AVIATION SCHOOL

A VERY excellent school of aeronautics has just been opened in Los Angeles—the Warren School of Aeronautics, headed by Charles A. Warren, who has operated the Warren Airplane Works for the past four years, and Col. G. C. R. Mumby, late of the R. A. F., a practical airplane expert and instructor. The business affairs of the school will be directed by Mr. Warren, while Col. Mumby will act as chief instructor. Capt. T. Cameron Wilkinson, also with an enviable war record, and a corps of instructors will assist.

Col. Mumby during the war was in charge of Hurst Park, Farnsborough and the Central Depot in England, commanding Lympne Airdrome, Chelsea workshops and Ascot.

The new school gives two courses—a ground course, in which airplane design, construction, repair and upkeep as well as motor work is taught, and a flying school.

The ground school is located 12 minutes from the heart of Los Angeles, on a main boulevard directly between two car lines. Day and night classes are held. The ground school equipment includes all types of complete airplanes and parts and Le Rhone, Gnome, Curtiss, Liberty, Hall-Scott, Hispano, Wright and other makes of motors.

The flying school is located inside the city limits, just two blocks from a car line.

Instruction is given on JN4. Standard, Travel Air and Romair ships, and facilities are provided for additional training on pursuit ships if desired.

Students may take either the ground course, qualifying for positions as airplane or motor men, or the flying course, or both courses combined. Features of the course include instruction in aero-photography, meteorology, parachute work and navigation.

MRS. DEAN COOPERATES

IN her desire to help in the advancement of aeronautics, Mrs. A. K. Dean has volunteered her services to help increase the circulation of AERO DIGEST in Portland, Oregon.

It is this spirit that will insure the growth of aeronautics throughout the United States. When the "female of the species" decides that an issue is worth fighting for, you may be sure it will go over!

FOR SALE
1925 WINNER
"On to New York" Air Race
Special Built OX5 Ship, in Excellent Condition, $1,500
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1 Canuck-Winged Hisso Jenny, Good Condition, $1,450.
Two Hisso E Motors, Newly-Built, $1,250 Each.
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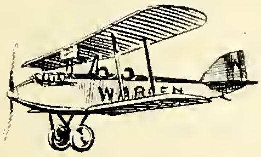

LEARN AVIATION IN LOS ANGELES

LEARN aviation in Los Angeles where there are 365 flying days per year. Here in California is concentrated more aviation activity than in any other section of America.

The Warren School of Aeronautics teaches airplane building, repair and upkeep; motor overhaul and upkeep; flying, navigation, meteorology, aero photography and parachute work. We are quoting special temporary low tuition rates for a limited time. New Department of Commerce Air Rules mean that only thoroughly trained men can operate and service airplanes. Get in on the big paying jobs.

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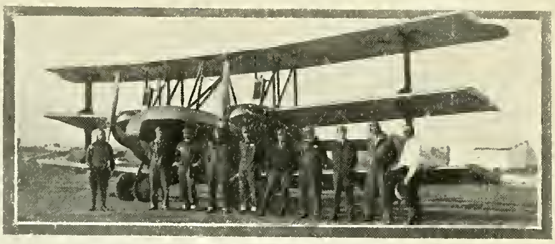

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NEWS OF THE AIR SERVICES

ARMY PAN-AMERICAN FLIGHT PROGRESS

On the first leg of the Pan-American flight several difficulties were encountered. At Tampico, the flagship *New York* is reported to have nosed over in taking off from the extremely muddy field. The *San Francisco*, piloted by Capt. Ira C. Eaker and Lt. M. D. Fairchild, missed the signal to return and flew on to Vera Cruz alone. When the other planes arrived the flight proceeded without delay until the takeoff from Aurora Flying Field, Guatemala City, when misfortune again overtook the flagship. Major Dargue was forced to land several miles out of the flying field in rough country damaging his landing gear severely. At this point the squadron was divided at the suggestion of Major Dargue confirmed by an order from the War Department. The *New York*, accompanied by the *St. Louis*, was to proceed bv the all water route to Colon, Panama, where repairs and replacements to the damaged ship could be made. The remaining three ships were to follow out the itinerary and make the scheduled visits in the Central American countries. The *New York* and *St. Louis* arrived at Colon on January 14. The *San Francisco, Detroit* and *San Antonio* visited cities in Costa Rica, Honduras and Nicaragua.

On January 18, the second division of the squadron landed at Colon thus completing the first leg of the flight.

New engines are being installed in the *St. Louis* and *New York*. Pending completion of the repairs and replacements on the two ships at France Field, the *San Francisco, Detroit* and *San Antonio* are visiting Colombia. Stops were made at Barranquilla, Girardot and Bogota, the capital. On their return to France Field they will be tuned up and the entire squadron will take off for the long trip down the west coast of South America.

Major Edward L. Hoffmann.

1926 COLLIER TROPHY

The Collier Trophy for 1926 has been awarded to Major Edward L. Hoffman of the Army Air Corps for his outstanding part in the development of the parachute as now universally used in this country and abroad. This development at McCook Field by the Army Air Corps under Major Hoffman's direction, extended over a period of five years, 1919 to 1924.

The parachute in its developed form is being manufactured commercially in the United States by the Irving Air Chute Company of Buffalo, who state in a letter to the Collier Trophy Committee that the development of the parachute was due to Major Hoffman's energy and untiring efforts. It is particularly significant that not a single life was lost through the dangerous years of experimental and development work in bringing this parachute to its present high state of perfection.

The records of the Army Air Corps alone show that the parachute, in the development of which Major Hoffman has been directly responsible, has saved twenty-six lives. The value of this device is recognized abroad as well as at home.

© *International.*

The U. S. Army Air Corps flyers who are making the Pan-American flight:
Capt. A. B. McDaniel, Lt. C. McK. Robinson, Capt. C. F. Woolsey, Lt. J. W. Benton, Maj. H. A. Dargue, Lt. E. C. Whitehead, Lt. B. S. Thompson, Lt. L. D. Weddington, Copt. I. C. Eaker and Lt. M. S. Fairchild.

RICHARD E. BYRD GETS RANK OF COMMANDER

Lt. Comdr. Richard E. Byrd, retired, of the United States Navy, has been elevated to the rank of commander, together with a Congressional medal of honor "for distinguishing himself conspicuously" on his flight over the North Pole on May 9, 1926.

This is the third promotion that Commander Byrd has had since he was transferred to retired list in 1916. During the war, he was advanced to the rank of lieutenant and in February, 1925, by Act of Congress, he was advanced to the rank of lieutenant commander.

154th OBS. SQUADRON

At the Memphis Armistice Day air meet the 154th Observation Squadron, Arkansas National Guard, was awarded the silver cup for the best formation flying.

Governor Tom J. Terral, in reviewing the remarkable record made by the squadron since its organization a little over a year ago, said: "The 154th Observation Squadron and its commander, Major Asbury W. Meadows is to be congratulated on the splendid record that has been made. Although they have only had their ships for approximately eight months, the squadron has made an enviable record in the aviation field.

"There are two men that I am especially proud of—Capt. Hall and Lieut. Vermilya for their heroic flight to obtain serum for Mr. Harvey Walthall."

The squadron has 14 officers and 60 enlisted men and only six "Jennies."

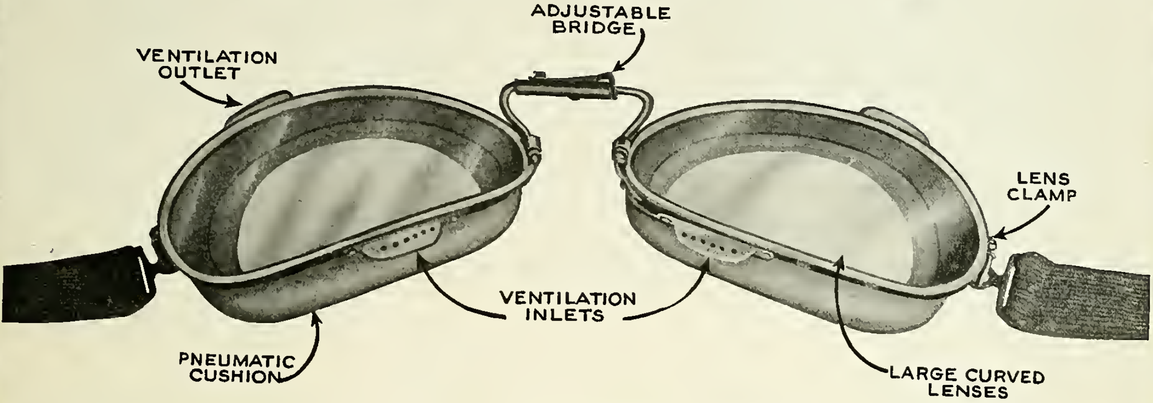
Two men have already graduated from Brooks Field, Lieut. Joe Shumate and Lieut. Robert W. Chrisp, while a third officer, 2nd Lieut. Robert McCarroll, is now taking the course. One officer, former 2nd Lieut. James Youngblood, is now at Brooks Field and is a cadet captain.

Pilots of the squadron are: Major Asbury W. Meadows, Capt. Murray W. Hall, Capt. Dave Wiegle, First Lieuts. Wright W. Vermilya, Robert W. Chrisp, Joe T. Shumate. Adrian Williamson and Griffith McSwine. Observers, non-rated, are: 1st Lieuts. Clem Wilson and Neil Romich; 2nd Lieuts. Benton Brandon, Hunter D. Scott, Robert McCarroll and Vivien M. Culver.

ARMY BUYS SEVENTEEN DOUGLAS TRANSPORTS

Seventeen 10-passenger troop transport planes have been ordered by the United States Army Air Corps from the Douglas Airplane Company. The planes carry a pilot and nine passengers, and are designed for fast transportation of small bodies of troops or for conversion into ambulance planes.

MEYROWITZ *Luxor Goggle* **MEYROWITZ**



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With first quality white lenses	$6.75
With first quality tinted amber or euphos (green) lenses	7.50

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ARMY AND NAVY AIR SERVICE ORDERS

ARMY AIR CORPS ORDERS

THE following Army Air Corps orders have been issued as of the dates indicated in brackets:

Andrews, 1st Lt. William Kossuth, jr., relieved from duty in time to enable him to arrive at his home June 30, 1927. (Dec. 28)

Barnes, 1st Lt. Harry C., jr., Ordnance Department, detailed to Air Corps on completion of foreign service; proceed to Brooks Field, Tex. (Jan. 11)

Boland, Capt. Thomas, detailed member of board of officers appointed to meet at Marshall Field, Kan., to examine candidates for appointment as second lieutenants in the Air Corps, vice Maj. Henry H. Arnold relieved. (Jan. 12)

Brooks, Maj. John B., relieved from present assignment and duties as student, Army War College, Washington Barracks, D. C.; detailed member of General Staff Corps, and assigned to duty with War Department General Staff, effective July 1, 1927; report in person to the Chief of Staff for duty. (Dec. 23)

Burwell, Maj. Harvey B. S., from McCook Field, Ohio, to Bolling Field, Anacostia, D. C. (Jan. 17)

Cabell, 2d Lt. Philip Frank, from New Orleans, La., to Fort Crockett, Tex. (Dec. 24)

Cassidy, 1st Lt. Benjamin B., Kelly Field, Tex., to commandant for duty. (Dec. 30)

Carroll, 1st Lt. James B., leave of absence, 10 days. (Dec. 29)

Cothran, 2d Lt. Francis E., from Fort Sam Houston, Tex., to Carnegie Institute, Pittsburgh, Pa., and to temporary duty at Third Corps Area Headquarters, Baltimore, Md. (Jan. 10)

Cronau, 1st Lt. Robert T., from Kelly Field, Tex., to Panama Canal Zone. (Jan. 17)

Crowley, 1st Lt. Francis Cornelius, from Dorchester, Mass., to Selfridge Field, Mich. (Dec. 21)

Day, Capt. Ewing Wilbur, jr., from Pittsburgh, Pa., to Langley Field, Va. (Dec. 21)

Dickson, 1st Lt. James Baker, from Evanston, Ill., to Chanute Field, Ill., for course of instruction for reserve officers. (Dec. 22)

Douglass, 2d Lt. Robert W., jr., leave of absence, 3 days. (Jan. 10)

Egan, 1st Lt. John Franklin, from Brooklyn, N. Y., to Langley Field, Va. (Dec. 21)

Elliott, 1st Lt. Marion L., Mitchel Field, N. Y., detailed Air Corps instructor, New York National Guard, New York City. (Dec. 27)

Ferguson, 2d Homer Wilbur, promoted to 1st Lt., Nov. 24. (Dec. 23)

Finch, 1st Lt. George Griffin, relieved from duty in time to enable him to arrive at his home June 30, 1927. (Dec. 28)

Finley, 1st Lt. Robert H., leave of absence, 1 month, 20 days. (Jan. 3)

Francisco, Capt. William Hale, relieved from duty in time to enable him to arrive at his home June 30, 1927. (Dec. 28)

Fredericks, Pvt. Charles L., from Bolling Field, D. C., to Mitchel Field, N. Y., for duty. (Dec. 22)

Giffin, Capt. Calvin E., from Rockwell Field, Calif., to Army Retiring Board at Presidio of San Francisco, Calif. (Jan. 8)

Harvey, Pvt. Malcolm B., from Mitchel Field, N. Y., to Selfridge Field, Mich. (Dec. 31)

Hodgson, 1st Lt. Jack C., from Brooks Field, Tex., report to commanding general Air Corps training center for duty at his headquarters. (Jan. 20)

Holterman, 1st Lt. Edward Henry, from Woodstock, Vt., to Langley Field, Va. (Dec. 30)

Hopkins, 2d Lt. Joseph Gerard, relieved from duty in time to enable him to arrive at his home June 30, 1927. (Dec. 28)

Lucas, 2d Lt. Mason H., from Brooks Field, Tex., to Fort Sam Houston, Tex., for duty. (Jan. 3)

Maughan, 1st Lt. Russell L., from Kelly Field, Tex., to Salt Lake City, Utah. (Jan. 20)

Mayhue, 1st Lt. Don W., leave of absence, 1 month. (Jan. 3)

Merz, Maj. Charles C., from Indianapolis, Ind., to Washington, D. C., for training in connection with procurement duties. (Dec. 31)

Moffat, 1st Lt. Reuben C., from McCook Field, Ohio, to Walter Reed General Hospital, Washington, D. C. (Jan. 12)

Moore, 1st Lt. John I., leave of absence, 2 mos., with permission to apply for extension of one month to leave continental limits of United States. (Jan. 15)

Moran, 1st Lt., William K., leave of absence, 3 months. (Dec. 21)

Nieminen, 1st Lt. Matt Alexander, from Aurora, Minn., to Selfridge Field, Mich. (Dec. 30)

Palmer, 2d Lt. Ivan Maurice, relieved from duty in time to enable him to arrive at his home June 30, 1927. (Dec. 28)

Parkin, Capt. Walter F., from Langley Field, Va., to Walter Reed General Hospital, Washington, D. C. (Jan. 17)

Pike, Lt. Col. Shepard L., relieved from assignment and duty as student, Army War College, Washington, D. C.; report to commandant Army War College for assignment to duty as instructor. (Jan. 20)

Ploss, 2d Lt. Roy Curtis, from Brooks Field, Tex., to Berkeley, Calif. (Jan. 17)

Post, 1st Lt. Leo F., leave of absence extended 19 days. (Jan. 10)

Reiss, 2d Lt. Stuart Adgate, from Washington, D. C., to Langley Field, Va. (Dec. 21)

Rich, 1st Lt. Arnold H., leave of absence, 1 month, 15 days. (Dec. 21)

Sellers, Capt. Cecil Gray, relieved from duty in time to enable him to arrive at his home June 30, 1927. (Dec. 28)

Stewart, Pvt. Willie A., from Mitchel Field, N. Y., to Bolling Field, D. C. (Dec. 22)

Stowe, 2d Lt. Jesse Beecher, from Sacramento, Calif., to Selfridge Field, Mich. (Dec. 21)

Voorhees, 2d Lt. Dan Frank, from Onargo, Ill., to Langley Field, Va. (Dec. 30)

Watkins, 2d Lt. Dudley Warren, promoted to 1st Lt., Nov. 14. (Dec. 23)

Whitten, 2d Lt. Lyman Perley, promoted to 1st Lt., Nov. 20. (Dec. 23)

Wilson, 2d Lt. Leo Craven, from Clayton, Ind., to Langley Field, Va. (Dec. 21)

Wiselogel, 2d Lt. Charles O., from Brooks Field, Tex., to Fort Sam Houston, Texas. (Jan. 17)

Woodring, 2d Lt. Alberta, from Tulsa, Okla., to Selfridge Field, Mich. (Dec. 21)

NAVY AIR SERVICE ORDERS

THE following Navy Air orders have been issued as of the dates indicated in brackets:

Adair, Ens. Crutchfield, detached Nav. Air Sta., Pensacola, Fla., to VT Sqdn. 2, Aircraft Sqdns., Battle Flt. (Dec. 22)

Akers, Lt. (j.g.) Frank, detached VF Sqdn. 1, Aircraft Sqdns., Battle Flt., to VF Sqdn. 5, Aircraft Sqnds., Sctg. Flt. (Jan. 8)

Armor, Ens. Howell, detached Nav. Air Sta., Pensacola, Fla., to VS Sqdn. 2, Aircraft Sqdns., Battle Flt. (Jan. 13)

Baker, Lt. (j.g.) James E., detached Nav. Air Sta., Pensacola, Fla., to VS Sqdn. 2, Aircraft Sqdns., Battle Flt. (Jan. 19)

Ballinger, Ens. Herbert R., detached Nav. Air Sta., Pensacola, Fla., to VT Sqdn. 2, Aircraft Sqdns., Battle Flt. (Dec. 22)

Barbey, Lt. Comdr. Daniel E., detached Nav. Air Sta., Pensacola, Fla., to temporary duty Rec. Bks., Puget Sound, Wash. (Dec. 20)

Barkelew, Lt. Elwood H., detached Nav. Air Sta., Coco Solo, C.Z., to VO Sqdn. 1, Aircraft Sqdns., Battle Flt. (*U.S.S. Colorado.*) (Dec. 24)

Butler, Lt. William, Jr., detached Nav. Air Sta., Pensacola, Fla., to VO Sqdn. 3, Aircraft Sqdns., Sctg. Flt. (Jan. 11)

Buse, Lt. Frederick R., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt. to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Ceres, Lt. Comdr. Frederick, (M.C.), detached VS Sqdn. 1, Aircraft Sqdns., Sctg. Flt. to staff, Aircraft Sqdns., Sctg. Flt. (Dec. 18)

Chapline, Lt. George F., detached VO Sqdn. 2, Aircraft Sqdns., Battle Flt., to VF Sqdn. 2, Aircraft Sqdns., Battle Flt. (Dec. 24)

Compo, Lt. George L., detached *U.S.S. Langley*, to c.f.o., *U.S.S. Lexington*. (Jan. 8)

Cornwell, Lt. (j.g.) Delbert S., detached VO Sqdn. 6, *U.S.S. Utah*, Aircraft Sqdns., Sctg. Flt. to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 5)

Crommelin, Lt. (j.g.) John G., Jr., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 13)

Dana, Lt. (j.g.) Winfred P. (M.C.), detached *U.S.S. Wright* to Sctg. Plane Sqdn. 1, Aircraft Sqdns., Sctg. Flt. (Dec. 18)

Darron, Lt. (j.g.) Roy R., detached VF Sqdn. 1, Aircraft Sqdns., Sctg. Flt. (Jan. 8)

Deam, Ens. Frank E., detached Nav. Air Sta., Pensacola, Fla., to VO Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 19)

Davis, Lt. (j.g.) William P., to duty VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. (*U.S.S. Texas.*) (Jan. 13)

Davis, Ens. William V., detached Nav. Air Sta., Pensacola, Fla., to VS Sqdn. 6, Aircraft Sqdns., Battle Flt. (Jan. 19)

Drinan, Lt. (j.g.) Raymond B., (Ch.C.), authorized to resume duty with Aircraft Sqdns., Battle Flt., uncompleted portion orders December 14, 1926, revoked. (Jan. 8)

Eddy, Lt. Myron F., detached Nav. Hosp., Annapolis, Md., to VO Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 13)

Ekstrom, Ens. Clarence E., detached Nav. Air Sta., Pensacola, Fla., to VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Jan. 19)

Ellis, Ens. Norman W., detached Nav. Air Sta., Pensacola, Fla., to VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Jan. 19)

Ewen, Lt. (j.g.) Edward E., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt. to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Gilbert, Lt. (j.g.) Ward C., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt. to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Grow, Lt. Comdr. Harold B., detached from all duty; resignation accepted December 31, 1926. (Jan. 4)

Hake, Lt. Harry F., (S.C.) detached Nav. Supply Depot, Nav. Oper. Base, San Diego, Calif. to Aircraft Sqdns., Battle Flt. (Jan. 20)

Harrigan, Lt. (j.g.) Daniel W., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 13)

Harvey, Ens. Warren W., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 19)

Haselman, Lt. George H., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt., to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Hawkins, Lt. Clarence A., to duty with VO Sqdn. 6 Aircraft Sqdns., Sctg. Flt. (*U.S.S. Florida.*) (Jan. 8)

Hazard, Lt. (j.g.) Harold G., detached VF Sqdn, 2, Aircraft Sqdns., Battle Flt. to VF Sqdns. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Hedding, Ens. Truman J., detached Nav. Air Sta., Pensacola, Fla. to VF Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 19)

Hickey, Lt. (j.g.) Robert F., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt. to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Hollingsworth, Lt. Wallace B., detached Nav. Air Sta., Coco Solo, C.Z., to VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Dec. 24)

Hopkins, Ens. Howard V., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 19)

Hough, 2d Lt. J. L., M.C., detached M.B., N.A.S., Lakehurst, N. J., to M.B., Navy Yard, Washington, D.C. (Dec. 22)

Humphreys, Lt. Harold E., (S.C.), detached Navy Yard, Norfolk, Va., to Nav. Air Sta., Oper. Base, Hampton Roads, Va. (Jan. 8)

Johnson, Ens. Leon W., detached Nav. Air Sta., Pensacola, Fla. to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Jan. 19)

Kernodle, Lt. (j.g.) Michael H., detached VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. to VS Sqdn. 1, Aircraft Sqdns., Sctg. Flt. (Jan. 8)

Kindell, Lt. Nolan M., detached Aircraft Sqdns., Battle Flt. (Dec. 24)

Lee, Lt. Thomas B., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt. to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Lenhart, Lt. (j.g.) John J., to duty VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. (*U. S. S. Florida*) (Jan. 13)

MacComsey, Lt. (j.g.) Henry F., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt., to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

McCrary, Capt. Frank R., detached command *U. S. S. Langley*, to Aircraft Sqdns., Battle Flt. (Dec. 24)

McGinnis, Lt. Knefler, detached VS Sqdn. 1, Aircraft Sqdns., Sctg. Flt., to command VJ Sqdn. 2, Aircraft Sqdns., Sctg. Flt. (Jan. 4)

Maile, Lt. Comdr. Francis M., detached command VO Sqdn. 2 (*U. S. S. New Mexico*), Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Coco Solo, C. Z., as commanding officer. (Jan. 11)

Masters, Lt. James C. (S. C.), detached Aircraft Sqdns., Battle Flt., to *U. S. S. Chaumont.* (Jan. 20)

Miller, Ens. Harold B., detached Nav. Air Sta., Pensacola, Fla., to VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Jan. 19)

Nash, Lt. (j.g.) Alan R., to duty VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. (*U. S. Arkansas*) (Jan. 8)

Nelson, Lt. A. D., detached VO Sqdn. 3, (*U. S. S. Concord*), Aircraft Sqdns., Sctg. Flt., to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 13)

Nichol, Ens. Bromfield B., detached Nav. Air Sta., Pensacola, Fla., to VT Sqdn. 1, Aircraft Sqdns., Sctg. Flt. (Dec. 22)

Ostrander, Lt. John E., detached VF Sqdn. 2, Aircraft Sqdns., to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Paunack, Lt. Comdr. Robert R., detached Bureau of Aeronautics, Navy Dept., to *U. S. S. Langley.* (Jan. 4)

Peterson, Lt. William L., detached *U. S. S. Raleigh*, to VO Sqdn. 3, Aircraft Sqdns., Sctg. Flt. (*U. S. S. Concord*) (Jan. 13)

Pixton, Lt. (j.g.) John E., detached Nav. Air Sta., Pensacola, Fla., to VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Jan. 13)

Radford, Lt. Arthur W., detached VO Sqdn. (*U. S. S. Colorado*); to VO Sqdn. 1 (*U. S. S. Pennsylvania*), Aircraft Sqdns., Battle Flt. (Jan. 17)

Ragsdale, Lt. Van Hubert, detached Aircraft Sqdns., Battle Flt., to Bureau of Aeronautics. (Jan. 19)

Rice, Ens. Lester K., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 11)

Ring, Lt. (j.g.) Stanhope C., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 13)

Roswall, Lt. (j.g.) Paul E., detached Nav. Air Sta., Pensacola, Fla., to VT Sqdn. 1, Aircraft Sqdns., Sctg. Flt. (Dec. 22)

Schlossbacb, Lt. Comdr. Isaac, detached command VJ Sqdn. 2, Aircraft Sqdns., Sctg. Flt., to command VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 5)

Shannon, Ens. John T., detached Nav. Air Sta., Pensacola, Fla., to VJ Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 11)

Shoemaker, Lt. Comdr. James M., detached command VF Sqdn. 2, Aircraft Sqdns., Battle Flt.; to Bureau of Aeronautics. (Jan. 5)

Snody, Lt. Allan P., detached Bureau of Aeronautics, to VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. (*U. S. S. Arkansas*). (Jan. 4)

Stores, Lt. (j.g.) Aaron P., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt., to VF Sqdns. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Sutton, Lt. (j.g.) Frank C., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 13)

Thweatt, Lt. Troy N., to duty VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. (*U. S. S. Texas*). (Jan. 8)

Tierney, Lt. Francis E. (M.C.) detached Nav. Air Sta., San Diego, Calif., to Battleship Divs., Battle Flt. (Dec. 18)

Tomlinson, Lt. Daniel W., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt., to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

(*Continued on page* 129)

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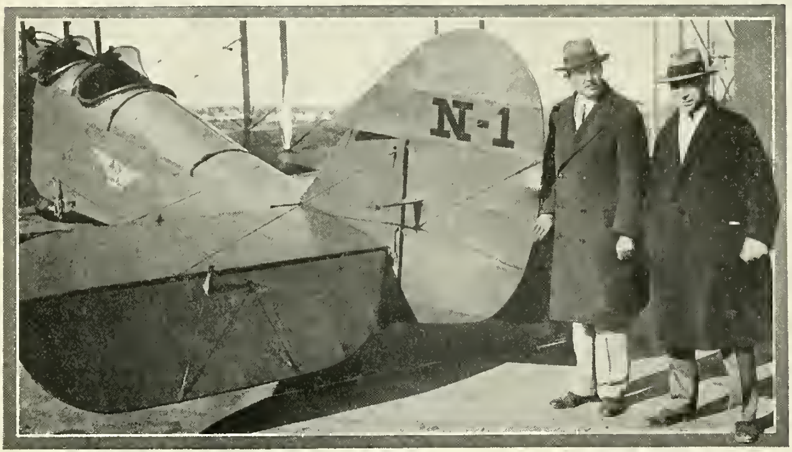

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Secretary of Commerce for Aeronautics Wm. P. MacCracken and Clarence Young, Chief of Air Regulations, tag the first plane at Bolling Field.

DETROIT NEWS

By Frank Bogart

THE First Pursuit Group, U. S. Army Air Corps, located at Selfridge Field, 25 miles from Detroit, one of the finest units of the nation's air fighting forces, has pioneered in many ways, under the command of Major Thomas G. Lanphier.

It was Major Lanphier, who, with five pilots, made the first night flying test of the transcontinental mail airway to determine how quickly squadrons of planes might reach the Pacific from the Great Lakes region. That was in the summer of 1925.

Only a few months before Major Lanphier had led 12 of his men on an attempted "dawn to dusk" flight from the Lakes to the Gulf, which just failed of accomplishment because landing facilities and servicing stations were not quite up to snuff in the South at that time. The trip was highly satisfactory from all other standpoints.

Now another notable flight has been undertaken by these crack pursuit pilots. Just as these lines were about to be dispatched for publication, word came from Washington that General Patrick had approved the request of Major Lanphier to accept the invitation of Director J. Stanley Scott of the Royal Canadian Air Force to visit Ottawa and Montreal.

Plans were at once laid for 12 of the latest type Curtiss pursuit ships and a Douglas transport to be fitted with skis and made ready for the start on January 24. Details of the trip will be told next month.

"This will be the first time that I have had an opportunity to test the mobility of so large an air force on so long a trip in winter weather," said Major Lanphier, who two years ago originated the idea of holding "winter maneuvers" in Northern Michigan and sustaining a regular military establishment for a week's time entirely by means of air transport.

"More important even than this, however, is the fact that this will be the first time an American air force has ever visited Canadian territory at the invitation of the authorities of the Dominion. It will do much to advance their own aviation cause, as well as our own, of course."

Major Lanphier intends to make Ottawa in one hop, remain overnight, fly to Montreal on January 25, to Buffalo on the 26th and return to Selfridge the fourth day.

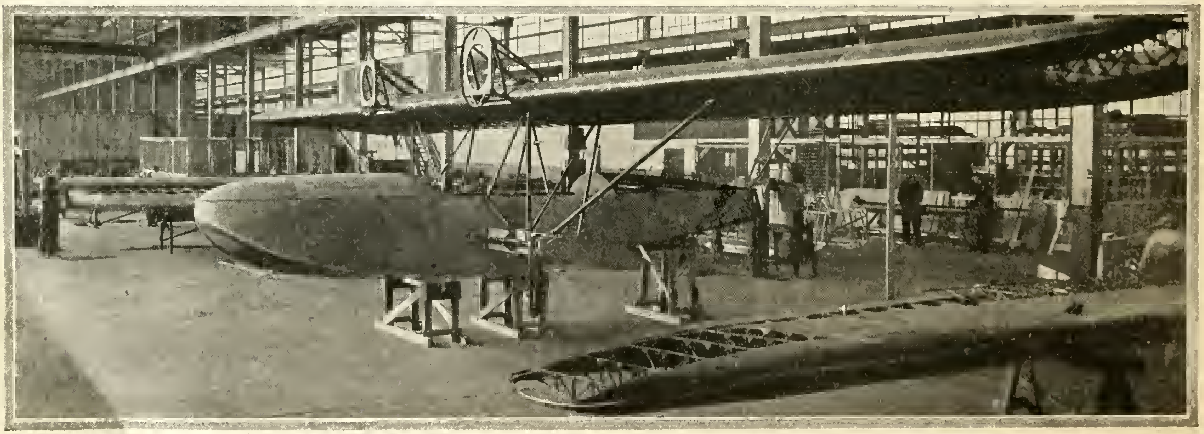
The following members of the First Pursuit Group were picked by him for the flight: Captains H. M. Elmendorf and Frank H. Pritchard; First Lieutenants St. Clair Streett, J. Thad Johnson, Arthur G. Liggett, Victor H. Strahm, and L. G. Mallory; Second Lieutenants John J. Williams, jr., L. H. Rodiack, L. C. Elliott, and Lee Gehlbach; and Staff Sergeant Byron Newcome.

Detroit has a vital interest in the awards soon to be made on the bids to operate the two sections into which the transcontinental air mail is to be divided when private operation starts next June. Two local airways companies have bids in,—Stout Air Services, Inc., having made the highest of four bids for the Western end, while National Air Transport, Inc., conceived and organized in Detroit two years ago with some of the biggest financial leaders of the city on its roster, have also bid for the contract.

Some time in February, probably as soon as the mail contract awards have been made, all the air mail contractors of the country will be called into convention here with William P. MacCracken, jr., assistant secretary of commerce for aviation, under the auspices of the Detroit Board of Commerce aviation division.

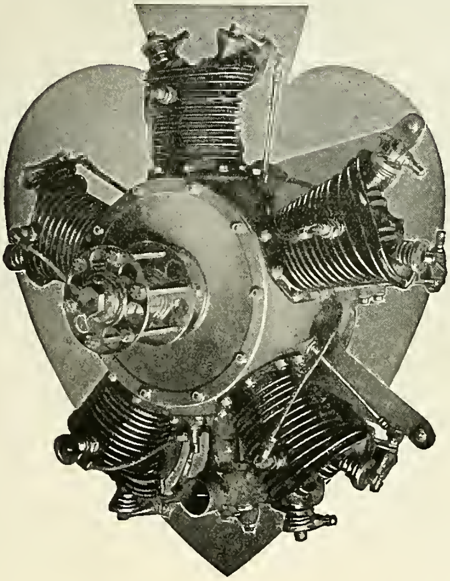
R. C. "Cliff" Durant, noted auto racing driver, has purchased a four passenger Stinson-Detroiter, enclosed cabin type.

The Packard Motor Car Company has completed its new shop building to house all aircraft engine activities. A new proving grounds 20 miles from the city, which contains an airdrome of 160 acres, will also be opened by Packard this spring.



The American Aircraft Company's "Airco" twin-motored amphibian flying boat, now nearly completed.

A MESSAGE TO AEROPLANE MANUFACTURERS



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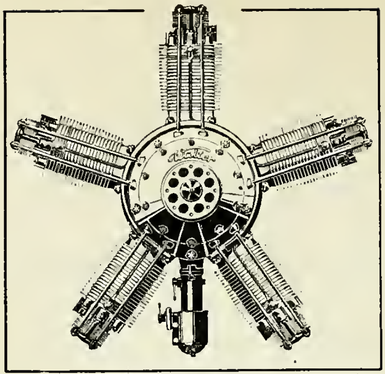
60 H. P. WALTER ENGINE

THE successful light airplanes constructed by the Avia firm in Czecho-Slovakia are powered with a particularly neat light engine produced by J. Walter and Company, Praha-Jinonice, Czecho-Slovakia. This engine is a five cylinder air-cooled radial. The steel cylinders are zinc coated and have aluminum fins cast on. The cast iron cylinder head is detachable. Twin Scintilla magnetos are installed.

The bore and stroke are 105 by 102 mm. Normal revolutions 1400, giving an output of 60 h.p. Its weight is 100 kgs. (220 pounds) and it consumes fuel at the rate of .23 kgs. (.51 pounds) per h.p. hour.

Avia B. H. 10 single-seater advanced training monoplanes fitted with the 60 h.p. Walter engine have a high speed of 102 miles an hour.


Front view of the 60 h.p. Walter engine.

"KING BIRD" AIRPLANE

THE King Bird commercial biplane produced by the Western Airplane Corporation of Chicago shows good all around performance and has been commented upon by pilots who have flown it for its ease of control, stability, and quick climb on the take-off.

The fuselage of the King Bird is of commercial grade Shelby seamless steel tubing. All joints are fitted and welded, there being no wire trussing in the fuselage.

The engine bed is of square Shelby tubing, bushed for the engine bolts. The engine mount is detachable by taking out four bolts, making the ship convertible from an OX5 job to one using any motor up to 220 h.p.

The flooring and seats are of plywood. The flooring is the width of the fuselage on the inside and extends from the fire wall back to the pilot's seat. Air rubber cushions are used on both the front and back bench seats to make the passengers and pilot unusually comfortable.

When fitted with dual control the instructor and student sit side-by-side in the rear cockpit. The rudder is controlled by suspended pedals. The vision over the left side of the rear cockpit, where the pilot normally sits, is excellent, and he also has clear vision over the front due to the arrangement of the windshields and cowling.

The stabilizer is adjustable on the ground, but may be made adjustable from the cockpit when so ordered by the purchaser.

The balanced rudder is all steel framework, sensitive both in the air and for taxiing on the ground.

The new W. A. C. wing section is used. One characteristic of this section is that of a quick take-off with practically the use of no elevator. The section has a high lift/drift and short travel of the center of pressure, although the c.p. for normal angles is located well back from the entering edge.

Dimensions, general specifications and performances of the King Bird are as follows:

General

Length overall	25 feet 4 inches
Height overall	9 feet
Spread overall	35 feet
Engine	Curtiss OX5
Rated h.p.	90 at 1,400 r.p.m.

Wing and Tail Data

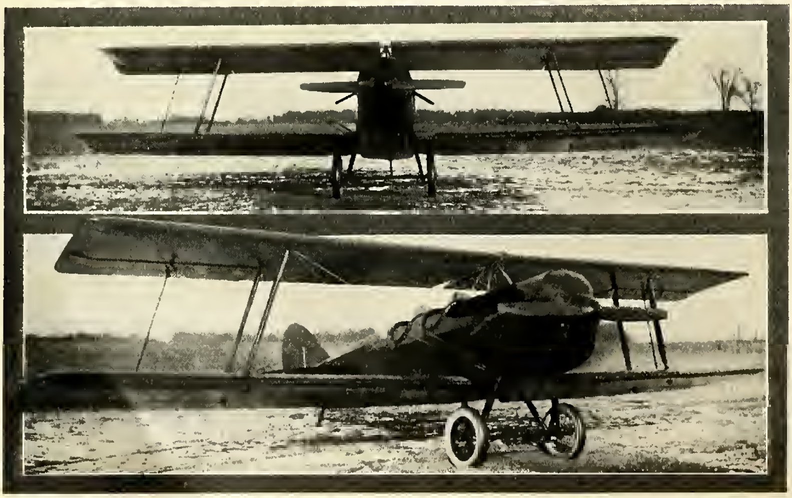
Span, upper wing	32 feet
Span, lower wing	35 feet
Wing chord	5 feet
Dihedral, lower wing	3 degrees
Stagger	10 inches
Gap between wings	5 feet
Upper wing (incl. ailerons)	160 square feet
Lower wing (incl. ailerons)	160 square feet
Ailerons (four)	32 square feet
Stabilizer	20 square feet
Elevators	16 square feet
Vertical fin	4 square feet
Rudder	10 square feet

Weights

Weight empty	1,200 pounds
Useful load (incl. fuel, oil, water)	800 lbs.
Gross total weight	2,000 pounds
Weight in pounds, per h.p.	22.22 pounds
Wing loading, per square foot	6.25 pounds

Performance

Landing speed	30 miles per hour
High speed at sea level	95 miles per hour
Cruising speed	85 miles per hour
Climb to 600 feet	1 minute
Service ceiling	12,000 feet
Endurance at full throttle	5 hours


The Western Airplane Corporation's "King Bird" commercial airplane.

LIGHT PLANE TIRES

THE B. F. Goodrich Rubber Company have just announced the development of a 20 x 4 straight bead airplane tire and have already arranged to go into production on it.

This new tire has been brought out primarily to meet the requirements of light airplanes. European airplane manufacturers have reached a high point of perfection in the design of the so-called light plane. American manufacturers also have given much attention to this type of craft during the last three years.

American manufacturers however, have been more or less handicapped in its development due largely to a lack of suitable material. More attention has been given to accessories for this type of plane lately with the result that considerable impetus has been given to American light plane construction.

The new Goodrich tire is ideally adapted to the light plane, being extremely light in weight, but possessing sufficient strength to resist landing shocks and give dependable service.

The new tire also serves in place of the customary tail skid on heavier planes facilitating handling of the plane to better advantage on the ground.

RAUTENSTRAUCH NEW SPLITDORF PRESIDENT

WALTER RAUTENSTRAUCH, formerly president of the Fred F. French Company, has been elected to the presidency of the Splitdorf-Bethlehem Electrical Company, filling the post recently vacated by the retirement from the business of M. W. Bartlett, and which was temporarily filled by E. H. Schwab, chairman of the board of directors.

Mr. Rautenstrauch is recognized as an authority on industrial problems in the fields of finance and economics. His election as president, following the recent appointment of Robert W. Porter as general sales manager, and Fred W. Upton and George W. Lang, as vice-presidents of the subsidiary, Splitdorf Electrical Company, in charge, respectively, of engineering research and production, is regarded as completing the final step in the plans of the merged concern's financial management.

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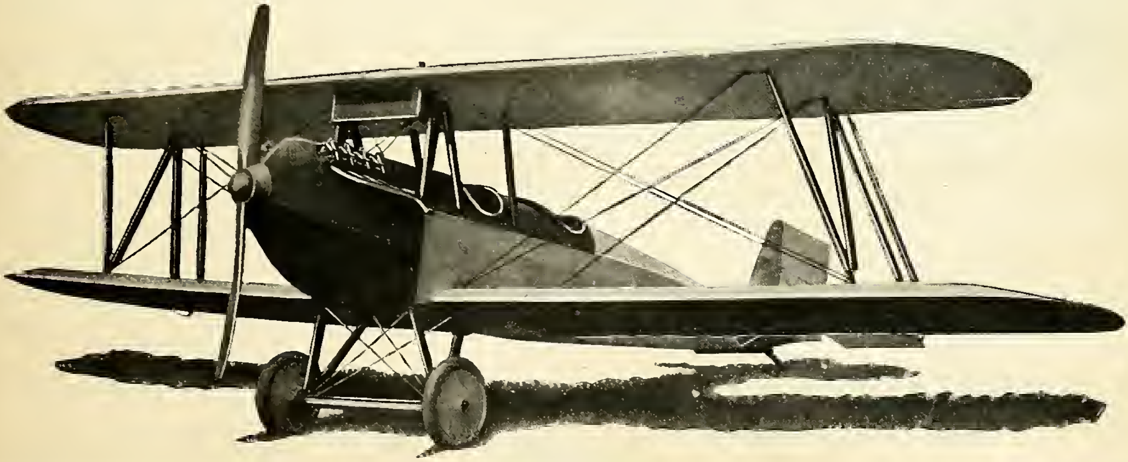
Brief Specifications:

SPAN (upper wing)	30 feet, 11 inches
SPAN (lower wing)	33 feet
OVERALL LENGTH	26 feet
HEIGHT	8 feet, 8 inches
LANDING SPEED	31 miles per hour
CRUISING RADIUS	400 miles
CRUISING SPEED	90 miles per hour
USEFUL LOAD	850 pounds
MAXIMUM SPEED	99 miles per hour
CLIMBING SPEED	550 feet per minute
DIHEDRAL (lower wing)	2½ degrees
STAGGER	19 inches
WEIGHT (empty)	1095 pounds
CEILING	17,000 feet
FUEL CAPACITY	35 gallons
MOTOR	OX5
PROPELLER	Hartzell



NATIONAL AIRWAYS SYSTEM -:- -:- LOMAX, ILLINOIS

THE DEVELOPMENT OF LUXOR GOGGLES

THE first Luxor goggle was designed and manufactured in 1902 by E. B. Meyrowitz for the use of a few drivers of the "horseless carriage" before the advent of the windshield. As the demand for more speed grew, so grew a wider demand for goggles. The first automobile racers—Barney Oldfield, Gaston Chevrolet and many other well known "speed demons", world-famous in their day for their daring and tremendous speeds of 40 to 60 miles per hour—were all users of Luxor goggles, then known as "Gogglettes".

The demand for speed soon spread to the water. Many yachtsmen installed powerful motors in light shallow-draft boats, and within a short time a fleet of fast water craft were darting in and out of the bays and rivers of the country. Luxor goggles proved to be of great value to speed boat racers.

During this time a new speed vehicle was being perfected—the airplane. In a very short time the airplane proved its value as an arm of modern warfare and new types were produced which attained greater speeds than many ever dreamed of. The pilots who flew these new high speed vehicles felt the great necessity of complete eye protection. Goggles had to be designed and built which were well ventilated, but at the same would keep out the strong drafts which caused the eyes to water and blur the vision. The necessity for wide unobstructed vision was very great.

The United States Government was confronted with a sudden demand for large quantities of goggles which afforded complete eye protection for the use of their aviators at the front and in the many flying schools both here and abroad. E. B. Meyrowitz, Inc. was given a contract to produce 10,000 pairs of goggles to meet their requirement. This order was completed before the date specified in the contract.

Hundreds of commercial pilots are using number 5 Luxor goggles throughout the United States. Luxor Goggles number 6, U. S. Air Service model, are used exclusively by the pursuit group at Selfridge Flying Field. Army and Navy racing pilots who have established world speed records in the past seven years have used Meyrowitz Luxor goggles. This success has only been made possible by combining years of optical experience with up-to-date, first-hand knowledge of the requirements of aviators. They keep their product up to date by continually "asking the men who fly". Many Luxor improvements in Luxor goggles have been made at the suggestion of pilots themselves.

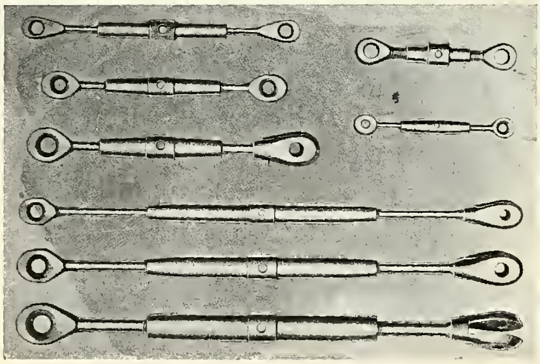
WILLIAMSON AIRPORT

FLOYD M. WILLIAMSON is conducting his airplane school at 3967 Grand River Ave., formerly known as the Detroit Aviation School but now operating under the name of Williamson Aviation School. In addition to classes in airplane and engine mechanics, a design course is being conducted by an engineer of long practical experience in American aircraft plants.

NEW AIR PERSONNEL FOR DEPT. of COMMERCE

DR. LOUIS HOPEWELL BAUER, formerly Major, Medical Corps, U. S. Air Service, has been appointed Medical Director of the Aeronautics Branch, Department of Commerce. Dr. Bauer joins the staff of Assistant Secretary MacCracken after thirteen years' service in the Army, of which seven and one-half years were in the Air Service. Dr. Bauer organized the School of Air Medicine at Mitchel Field and was commandant of that organization for six and one-half years. In addition to being the author of many articles in regard to flight surgeons' duties, he is well known as the writer of "Air Medicine."

R. G. Lockwood, recently civilian test pilot at McCook Field, has been appointed Supervising Inspector in the Registration Division of Aeronautics Branch, Department of Commerce, Mr. Lockwood enlisted in the Royal Flying Corps in 1915, serving in that organization and with the Royal Air Force until 1919, when he joined the Service Aviation Company. In 1920 he became a test pilot at McCook Field where he served until his present appointment. During this period he added 2,486 hours' and 30 minutes' official flying time to his record. He has tested all types of aircraft used in the United States Army, in addition to which he was organizer of the Liaison Section and Chief of the Planning Bureau of the Flying Section at McCook Field.



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BUFFALO NEWS

By Harry V. Atkinson

THE aviation industry here is expanding. More room is required for increased production.

The Elias company has purchased a tract of land adjacent the new airport and will soon erect a modern plant. A. J. Elias, one of the city's most enthusiastic aviation men, is forming a new aircraft company which will be entirely independent of his large lumber interests. Max Stupar will continue as designer.

The Consolidated company has just completed a large addition and have added more machinery to their already well equipped factory. The wall and ceiling of the entire plant have been painted white.

Elias is building a special closed job for a local enthusiast and Eberhart is at work on a new commercial ship. Curtiss and Consolidated Aircraft are turning out pursuit and training planes and Irving is busy on parachutes.

On completion of the new Elm vocational school classes will be instituted in the construction of airplanes and also in the building and repairing of motors. Here the student will be taught the rudiments of aviation and later the classes will be taken to the municipal airport where they will receive practical instruction on ships in actual service.

ST. JO. PROGRESSIVE

ST. JOSEPH is recognized as one of the most progressive cities in aviation in the United States. Daily the air mail planes fly in and out of the city, and nearly 200 planes a month make Rosecrans field a stopping point on their travels.

Aviation won its place in the consideration of St. Joseph people because of the efforts of several tireless enthusiasts, chief among whom is Carl Wolfley. Mr. Wolfley was in the automobile business when transportation by air began to be recognized as a practical thing. He stayed with his business, but made aviation his hobby and gave it more and more of his time until he was using every energy to make St. Joseph see the value of getting in on the ground floor in the new flying game. Today Mr. Wolfley is director-manager of the St. Joseph Aeronautic Association and general manager of Rosecrans Municipal Air Field. His most recent proposal is the manufacture there of a new type of plane which he believes will help commercial flying.

NEW FLYING GLOVE

AN improved flying glove has recently been put out by A. G. Spalding & Bros., designed especially for cold weather and high altitude work. In general appearance it is the Spalding glove and mitten combination, with the mitten that flaps back and clips on the back of the wrist. It is completely lined with fur, and is now being used extensively in the services and by commercial pilots.

H. Ridgeway Hart of the Spalding company, has recently been awarded patents on a flying helmet and face mask. Mr. Hart is responsible for a great many of the improvements in flying gear.

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Complete Construction Outfit 7.50
JN4D—2 Curtiss Plane: 3 ft. size
Complete Construction Outfit 7.00

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....

TWO NEW "PLYMETLS"

DURALUMIN Plymetl is a new material for the aircraft industry. It is made by cementing a thin sheet of hard aluminum, commonly called duralumin, to an aircraft Haskelite panel. It is being placed upon the market by Haskelite Manufacturing Corporation, and samples are being tried out by some of the larger aircraft companies.

That this type of Plymetl is destined to give good satisfaction and find a large field of usefulness is indicated by this company's experience with a similar material commonly known as Plymetl, which is made by cementing a thin sheet of weatherproof steel to a commercial Haskelite panel. This material has gone into very wide use in the vehicle industry, as well as in numerous other industries. Both duralumin and Haskelite have found large use in the aircraft industry, and it is suspected that the combination of these two materials will, for many uses, become more popular than either by itself.

In order to keep the weight of duralumin within limit, it is commonly used in a very thin sheet. While this material is very strong in tension, the thin sheet lacks stiffness, showing a tendency to buckle like paper.

Haskelite is comparatively stiff. When the two are united to form duralumin Plymetl, the product is still stiffer than either of them or their sum. The weight of the duralumin sheet is only slightly larger than that of $\frac{1}{16}$" Haskelite. The addition of this weight to Haskelite increases its stiffness in much larger proportion than it increases its weight.

Most of the tests that have been made upon the properties of the material have employed a Plymetl in which the aluminum sheet is only half hard. These tests indicate that the shearing strength of the joint between the Haskelite and the aluminum is about 225 lbs. per square inch. The strength for duralumin may be considerably larger than this because one or two series of tests in which this material was used indicated much larger values for this strength. Specimens were cut from a sample which had been soaked for 72 hours and then dried, and these specimens showed an average strength of 160 lbs. per square inch. A number of samples have been vibrated in an endurance testing machine for many millions of oscillations. In some of these tests the metal itself was broken, but in none of the tests was there any indication of injury to the glued joint between the Haskelite and the aluminum. Series of tests have been run which indicate that the material, when reasonably painted, will give a long service under ordinary weather exposure as well as when occasionally subjected to submersion in water.

"Monel-Plymetl", is in reality a panel of Haskelite faced, on one or both sides, with a sheet of Monel Metal, or with Monel Metal on one side with the reverse covered with "Vapo-Metal," a specially prepared waterproof metal. When an absolute flat panel is desired, one that will not be affected by change of moisthre content of the plywood core, a metal backing is necessary.

The metal face of "Monel-Plymetl" gives Haskelite superior resistance to weather, rust and wear. The corrosion-resisting properties of Monel Metal combined with the advantages of Haskelite results in a stiff, light metal surface, highly resistant to chemical reaction and physical abrasion.

"Monel-Plymetl" can be cut with an ordinary band saw; it can be formed and riveted hot or cold; rendering the panel adaptable to various types of construction. Tests indicate a $\frac{5}{16}$-in. rivet will support a load of more than 2,000 lbs. before failure, and a $\frac{3}{8}$-in. rivet over 3 000 lbs.

NAVY AIR SERVICE ORDERS

(*Continued from page* 120)

Vieweg, Ens. Walter V. R., detached Nav. Air Sta., Pensacola, Fla., to VT Sqdn. 2, Aircraft Sqdns., Battle Flt. (Dec. 24)

Wagner, Lt. Comdr. Frank D., detached Aircraft Sqdns., Battle Flt., to command VS Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Warrack, Lt. Robert C., detached VF Sqdn. 1, Aircraft Sqdns., Aircraft Sqdns., Sctg. Flt. (Jan. 8)

Wead, Lt. Frank W., detached VF Sqdn. 2, Aircraft Sqdns., Battle Flt., to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Dec. 24)

Welborn, Lt. Max, to duty with VO Sqdn. 6, Aircraft Sqdns., Sctg. Flt. (*U. S. S. Florida*). (Jan. 8)

Whitney, Lt. (j.g.) John P., detached VS Sqdn. 1, Aircraft Sqdns., Sctg. Flt., to Nav. Air Sta., Pensacola, Fla. (Dec. 31)

Wyatt, Lt. Ben H., detached Officer in Charge, Alaskan Aerial Survey Expedition, to *U. S. S. California*. (Dec. 24)

Young, Lt. (j.g.) Clifton A. (M.C.), orders October 16, 1926, modified, to Torp. and Bombing Plane Sqdn. 1, Aircraft Sqdns. Sctg. Flt. (Dec. 18)

Young, Ens. Rufus C., detached Nav. Air Sta., Pensacola, Fla., to VJ Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 11)

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711-7

NEW MOORING MAST AT SCOTT FIELD

By Thos. W. Parry, Jr.

WITH the completion by the end of February of a 176-foot mooring mast at Scott Field, Belleville, Ill., about 30 miles from St. Louis, there will be adequate facilities at the flying field to care for large lighter-than-air craft. Col. John A. Paegelow, commander at Scott Field, hopes to secure an appropriation for such a ship and declares that he wants to be ready providing it is forthcoming. Hence the mooring mast.

The accompanying photograph of the big mast was taken when it was riveted together to a height of eighty feet. It is located about a quarter of a mile east of the mammoth Scott Field hangar.

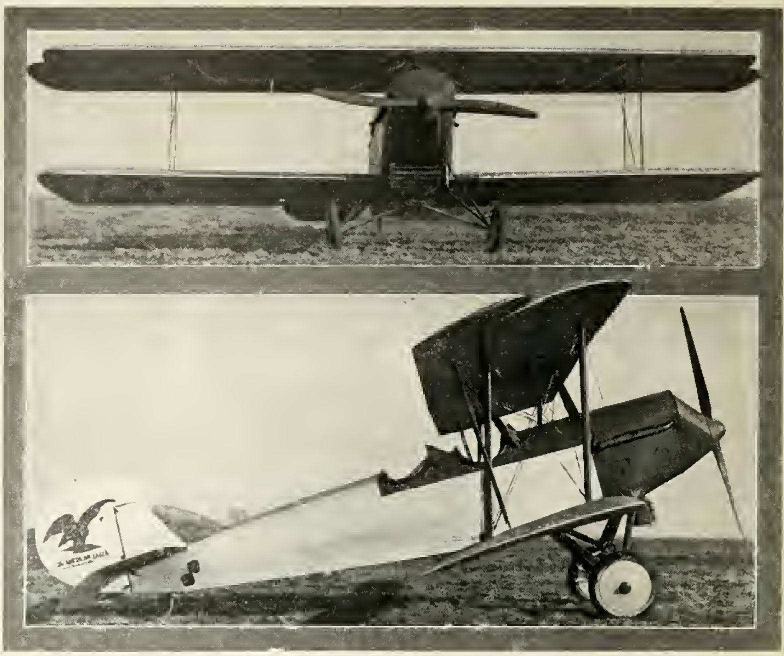
Of the same dimensions as the mooring masts at Lakehurst, N. J., and at the Ford Airport in Detroit, the tubular construction of the Scott Field mast is a decided improvement over the open structural steel work of these. On a concrete base the mast rises tapering from an eighteen-foot to an eleven-foot diameter for a height of 35 feet and then rises skyward for 141 feet like a huge steel chimney. The steel plates at the base are half an inch thick, while toward the top they are thinner.

The mast is built to eventually house an elevator, but for the present pilots will have to walk to its top. At the top will be a circular balcony and the mooring swivel and supply pipes, ready to refuel tethered air cruisers.

At the side of the base is a supply house where engines for the winches and gasoline and water pumps are installed, and also an electrical unit supplying power to beacons at the mast top. Four pipes run from the supply house to the mast top for carrying gasoline, water, winch cables and electrical wiring. Pilot and occupants may walk through the nose of the ship into the mooring mast. Because the mooring swivel to which the ship is attached revolves, high winds can have no damaging effect.

St. Louis News Serv.

Airship mooring mast being erected at Scott Field, Belleville, Illinois.



The OX5-powered American Eagle airplane produced at Kansas City.

THE AMERICAN "EAGLE"

SOME of the special features of the American Eagle commercial biplane are an all-steel tube fuselage structure in which no rigging wires are required; all-steel tail surfaces; balanced ailerons and rudder; individual aileron control by means of tubes direct to each aileron, eliminating all pulleys and their attending friction; no pulleys are used anywhere in the ship.

The split type landing gear is provided with 14 feet of shock absorber cord which may be wrapped in five minutes. The landing gear is equipped with all replaceable parts and may be completely removed in a few minutes. The Alimite system is used to lubricate wheel hubs. The tail skid is quickly removable to rewrap shock absorber cord.

Dual controls are provided in the completely upholstered cockpits. Radiator shutters and a Hartzell propeller are standard equipment. The engine is completely cowled adding to the appearance as well as detracting from resistance.

Technical data on the American Eagle plane manufactured by the American Eagle Aircraft Company of Kansas City, Mo.:

General

Length overall	23 feet 5 inches
Height overall	96.5 inches
Spread overall	30 feet
Engine	Curtiss OX5
Rated h.p.	90 at 1400 r.p.m.

Wing and Tail Data

Wing curve	Aeromarine 2A
Dihedral lower wing	2 degrees
Stagger	15 inches
Gap at body	5 feet 2 inches
Incidence angle, both wings	2.5 degrees
Wing chord	5 feet 2.5 inches

Areas

Upper wing (incl. ailerons)	154 square feet
Lower wing (incl. ailerons)	141 square feet
Ailerons (two)	34 square feet
Stabilizer	19 square feet
Elevators	16 square feet
Vertical fin	3 square feet
Rudder	9.25 square feet

Weights

Weight empty	1145 pounds
Pay load	400 pounds
Gasoline and oil	300 pounds
Pilot	180 pounds
Gross total weight	2025 pounds
Weight in pounds per h.p.	22.5 pounds
Wing loading, per square foot	7 pounds

Performance

High speed at sea level	96 miles per hour
Landing speed	31 miles per hour
Climb to 600 feet	1 minute
Climb to 2500 feet	5 minutes
Endurance at full throttle	4 hours

STICK AND WING CLUB

THE purpose of the Stick and Wing Club of Tri-State College, Angola, Ind., is to further the scientific advancements of aeronautics and give actual flying experience to its members. One of the chief aims of the club is to design and build a light plane for training and competition purposes. Classes have been started and are attended by all members.

Membership at this time consists of 15 students; by spring it is expected that 35 members will be enrolled. In the spring a training type of airplane will be purchase and flight training given to 10 students.

A few students taking the study are to be candidates for the Army Air Corps Training School and are taking this means to secure a good working knowledge of aeronautics.

Raymon L. Robilio has been appointed instructor both of class work and actual flying.

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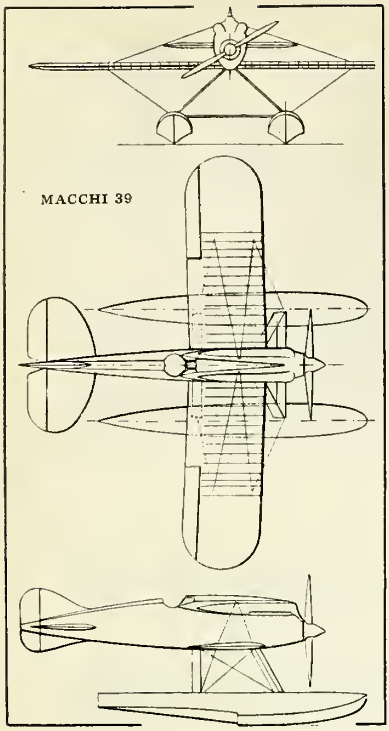


Outlines of the Macchi racing plane.

THE MACCHI RACER

At the time Italy won the Schneider trophy from the United States, establishing the record speed of 246.496 m.p.h., no technical information was available on either the Macchi monoplane or the Fiat engine which powers it. Even now comparatively little is given out for publication. The data now available through the French aeronautical press (L'Aeronautique) is interesting, for assuming the weight in lbs. per h. p. is correct, then the engine must actually develop 880 h. p. instead of 780, the power claimed.

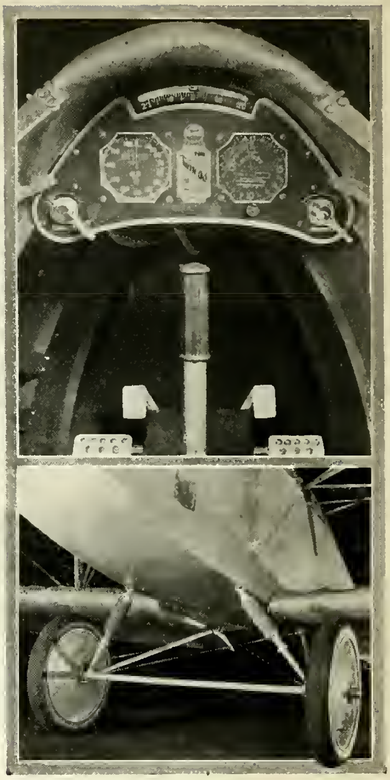
In the accompanying drawing, the dimensions correspond closely with the outline given. Dimensions are as follows: Span, 30.4 feet (9m, 26). Length (not including floats), 22.1 feet (6m, 743). Height, 10.05 feet (3m, 06). Supporting area of wings, 156 square feet (14 sq. m. 50). Length of each float, 19.7 feet (6 m.). Weight of structure, 1,958 pounds (888 kg.). Weight of engine group, complete, 910 pounds (412 kg.). Weight of plane, empty, 2,868 pounds (1,300 kg.). Weight of plane fully loaded, 3,565 pounds (1,615 kg.). Loading per square foot, 22.8 pounds (112 kg. per sq. in.). Loading in pounds per h. p., 4.05 pounds (1 kg. 8). Calculations show that instead of the h. p. loading being 4.05 pounds, this figure would actually be 4.59 pounds with an engine of 780 h.p. (or 800 h.p. according to the French method of rating). The natural conclusion is that the engine really develops 100 h.p. more than reported, or 880 h.p.

In the British aeronautical press the power of the Fiat type A-S2 engine is given as 882 h.p. at 2,500 r.p.m., which checks the calculations noted above. The engine has 12 cylinders; bore, 140 mm.; stroke 170 mm. Cubic capacity 31.4 litres. Compression ratio 6 to 1. Illustrations of the Macchi plane and the Fiat engine appeared in the November issue of Aero Digest.

JOHNSON TWIN-60

Since the first announcement of the new Johnson Twin-60 plane was made in Aero Digest last month considerable interest has been shown in this latest addition to the commercial airplane market. In the accompanying illustrations two detailed views are shown. The upper view shows the cockpit interior, instrument board and controls. The pedals for rudder control and wheel brakes are shown.

In the lower view is shown the simplicity of the landing gear, wheel brakes, and the rubber disc shock absorber units.



Cockpit and landing gear details of the new Johnson Twin-60 commercial plane.

THE AIR KING

Because of its universal use and perfected performance, the Curtiss OX5 engine was selected as the power unit in the Air King airplane produced by the National Airways System, Lomax, Ill. Replacement parts for the OX5 are carried in stock in many parts of the country and may be secured without delay.

The fuselage is of trussed steel tubing throughout, with no wires necessary. Wings are built up of ash and spruce, with steel tube tips. Ribs are 9 inches apart in the slip stream. Wings are interchangeable. All struts and landing gear members are of thick-wall duralumin tubing set into Balsa wood stream-liners which are linen wrapped and varnished to protect them from moisture. Tubing is painted inside and out to resist corrosion.

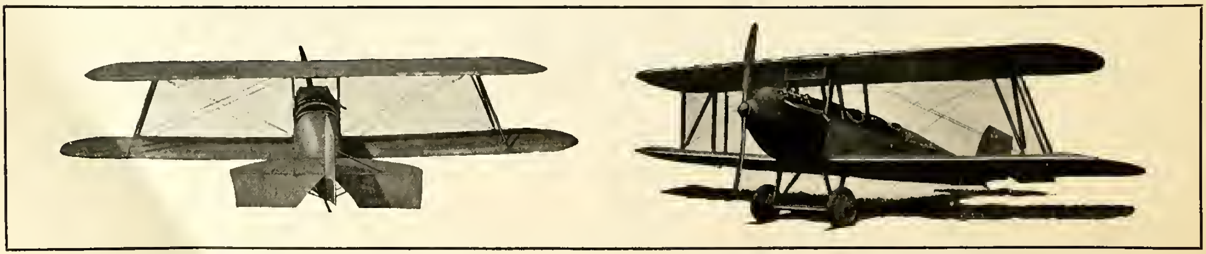
The tail group is fastened to the fuselage with dural tubing. Framework of the tail group is channel duralumin and the outer edge of the fin is formed with half-inch dural tubing.

Ailerons are worked in pairs, each pair independent of the other; normal control of the ship is possible with the right hand or left hand ailerons alone.

The tubular honeycomb radiator is mounted laterally below the upper wing, permitting wide visibility and adequate cooling. The Hartzell propeller used is especially designed for efficient use in connection with the OX5.

General Specifications

Span, upper wing	30 feet 11 inches
Span, lower wing	33 feet
Length overall	26 feet
Height overall	8 feet 8 inches
Stagger	14 inches
Dihedral, lower wing	2.5 degrees
Weight empty	1,095 pounds
Useful load	850 pounds
Maximum speed	99 miles an hour
Cruising speed	85 miles an hour
Landing speed	31 miles an hour
Ceiling	17,000 feet
Climb in one minute	550 feet
Fuel capacity	35 gallons
Cruising range	400 miles



The OX5-engined "Air King" three-passenger commercial airplane produced by National Airways System.

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BOSTON AIRPORT NEWS

By G. W. Hamblin, Jr.

PERHAPS the most interesting addition to the staff of the Boston Airport Corp. is the snow-roller, devised by B. F. Billings, chief pilot of the corporation, and executed by Eddie O'Toole, vice-president and chief mechanic, and E. W. Wickford, along with several other fellows. This snow-roller consists of three large spools, such as used for electric wire, covered with sheet iron. The drums are mounted on an axle, and have three stout timbers attached, to which the army tractor is hitched, and thus the snow-covered runways are made solid enough to fly from.

A. W. Rosecrans, with ten hours' instruction, took a T A up to ten thousand feet, for the altitude record of the Airport Corp. student class. Rosecrans has also stunted the ship with the ease of a veteran. Mr. Eaton of Boston has been enrolled in the flying school at the airport, bringing the total up to thirty-seven. Student flyers Granville and Spaulding have been soloed by Billings.

Two petitions were filed with the State Legislature January 15, both incorporating ideas for the improvement of the airport. The first petition, presented in the name of C. E. Kimball, president of the Associated Industries, provides that the entire filled-in area on which the airport now stands be set aside by the state permanently for aviation purposes, and also that the hangars be moved back toward the seawall, and the entire area leveled off, so that larger and more ships can be accommodated.

The second petition, which was filed at the request of the State aviation committee of the American Legion, provides that one senator, two representatives and four others be appointed by the Governor to compile a definite policy for the advancement of aviation in Massachusetts, to arouse interest throughout the State for the establishment of municipal landing fields, and to take any action necessary to advance the cause of flying.

It has been rumored that Lieut. Comdr. Noel Davis, former commanding officer of the Squantum Naval Air Base and at present in charge of all Reserve flying in the Navy, will use Boston as his hop-off point some time during the coming summer for an attempted flight across the Atlantic to Europe. This flight it is understood, will not be a Navy venture, but will have the Navy's unofficial support. Details of the flight are expected at an early date.

P. & A. Photo.

Pilot Short's wife and baby greeting "daddy"—winner of the Harmon Trophy.

HARMON 1926 TROPHY TO AIR MAIL PILOT

SHIRLEY J. SHORT, ace of Post Office air mail pilots, has been awarded the Harmon Trophy for 1926 by the American Section of the International League of Aviators. Short was selected because he flew 2,169 hours, 14 minutes between July 1, 1923, and November 30, 1926, without serious mishap, on scheduled air mail flights, night and day, in all weather, in various types of airplanes used by the Post Office Department.

Short was born at Elliott, Ill., January 8, 1895. He was appointed to his present position in the Post Office Department Air Mail Service March 2, 1923. He received his training at Barron Field, Fort Worth, Tex., and had flown between 1,000 and 2,500 hours before joining the Post Office flying force. His mileage with the air mail totals at the average rate of at least 80 miles per hour, or 175,520 miles in about two and a half years, without serious accident of any kind. Since his appointment on March 2, 1923, Short has flown 2,382 hours and 7 minutes, and covered a distance of 235,754 miles up to December 31, 1926. Forty-seven percent of his flying was at night. He is employed on the transcontinental route and operates between Cleveland and Chicago.

The League's bronze medals were given to Commander Richard E. Byrd and Floyd Bennett for their flight to the North Pole.

The Harmon trophy for Japan was awarded to Commander Hirosi Abe, who last year flew from Tokio to Paris and London. The trophy for France went to Pelletier d'Oisy for his Mediterranean flight and the trophy for Italy to Major Mario de Bernardi for winning the Schneider race.

Cleburne J. Eberhart, Jr., pilot Ted Mosely, in cockpit, and photographer Jess Pelletreau about to take off to attend Governor Smith's inauguration.

ATLANTA AIR NEWS

By Walter B. Ratliff

GEORGIA School of Technology, located at Atlanta, has just been given equipment valued at $40,000 for use in the course in aeronautics, it is announced by Lieutenant Edgar E. Glenn, air corps instructor. The gift is from the government, and will add greatly to the effectiveness of the course.

Included in the equipment is one DH plane for ground work, a new Liberty 12-cylinder motor specially mounted for classroom demonstrations, one Hispano Suiza motor and a Rhone engine. In addition there are five traps, five Winchester pump guns and clay targets, four new type aerial bombs, a radio set and machine guns.

In line with the policy of stimulating further interest in aeronautics, Professor Charles M. Daniels of the mechanical engineering department will give a six weeks' course in airplane engines. It will be open to all students at Georgia Tech. Another course in aerodynamic will be given juniors at the school.

PITTSBURGH AERO CLUB

By Ray A. Tucker

THE Aero Club of Pittsburgh is to hold its Fifth Annual Aviation Ball on Friday evening, February 4, in the William Penn Hotel. The Aero Club extends a blanket invitation to all pilots and other aeronautical men to proceed to Pittsburgh upon this occasion.

Due to many requests, the Aero Club recently established a Speakers' Bureau, whose personnel has been made up of members of the club. The bureau will furnish speakers to luncheon clubs, business organizations, schools and church societies, who will use as their subject—the strides made in commercial and military aeronautics.

BUFFALO AIRPORT

By Notso

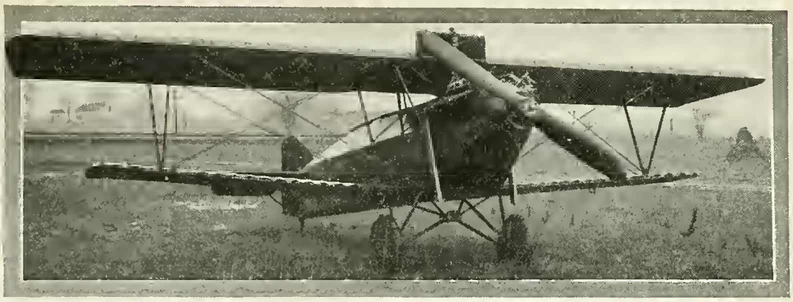
LES IRVIN, genial inventor and Moth pilot, has brought from England a new parachute testing dummy idea which has proven a great boon to the local "chute chasers". It's easy, they say, to distinguish between the dummy on the chute and the dummy on the crew. The new dummy is *all* wood, carrying its lead both fore and aft.

Pilot Ted Mosely got chatty with Gov. Al Smith the other day when he carried a newspaper photographer to Albany to view the inauguration ceremonies. Ted also carried a letter from the "gang" at Buffalo Airport as well as from Cleburne J. Eberhart, Jr., local airplane manufacturer who loaned his ship for the trip.

Tex had a lot of grief returning, having been held up at Albany for three hours trying to get off in the snow, and forced down at Syracuse because of storms and darkness. Ted says that flying the day after New Year's eve is all "boloncy".

Harry Hilliker and Bradford, his pilot, have been making first hand inspections of the Falls recently as well as the new Peace bridge. Since Ontario went wet it is rumored that several nice "emergency fields" have been noted across the border.

KENTUCKY CARDINAL COMMERCIAL AIRPLANE



The Kentucky Cardinal, a new commercial type now in production.

THE Kentucky Cardinal is one of the latest ships of the commercial type to be placed on the market. This ship is built by the Kentucky Aircraft Corporation of Owensboro, Ky. The new plant which this corporation is erecting is to be one of the most modern in the industry.

The Kentucky Cardinal differs very markedly from the average commercial type of ship. During the past two years a great deal of experimental work and actual flying were necessary to develop this plane.

The control system is of simple design. Both the elevators and the ailerons are actuated by pull and push rods direct from the controls and are easily adjustable. The only wires in the control system are those used to operate the rudder, and these are oversize and do not touch the structure throughout their entire length. The ship will not spin and has lateral control far beyond the stalling angle, which was obtained by the use of differential ailerons which extend the full length of the upper wings.

The difference most noticeable in the design, perhaps, is the wings. The lower wing is small, having only one spar and a chord of 28 inches. This greatly increases the visibility not only because of the small lower wings but, due to the decreased interference between the wings, it was possible to lower the upper wing so that it is more nearly parallel to the pilot's line of vision. The design of the wings seems to combine the structural advantages of the biplane with the aerodynamic efficiency of the monoplane and obtaining better visibility than is possible to obtain in either of the standard types. The wings are of conventional construction.

The radiator and gas tank are placed in the upper wing. They do not interfere with the pilot's vision and can be removed easily for repairs. The gas tank is made of terne plate in order that repairs can be made wherever a soldering iron is available.

The fuselage is of welded steel tube construction with no bracing wires. The tail surfaces are also of welded steel tube construction.

The engine mounting and cowling are arranged so that any part of the OX5 motor is easily accessible.

The passengers' and pilot's cockpits may be entered through doors provided for this purpose. These doors do not pierce any structural member nor weaken the ship.

Realizing the need of carrying baggage on cross-country flights, a six cubic foot baggage compartment is provided and placed in such a position that the balance of the plane is not disturbed whether baggage is carried or not.

The split axle landing gear and steel spring tail skid are of rugged construction. The shock-absorbing unit of the landing gear is easily accessible and can be replaced in a short time. The landing gear is designed to check rebound after a hard landing.

The high speed of the ship is estimated to be well over 100 miles an hour and it has climbed to 11,000 feet in 23 minutes.

Every effort has been made to produce a ship that will give good service in commercial flying with a low cost of maintenance. The Kentucky Aircraft Corporation should be commended for the manner in which they have developed this ship before marketing it.

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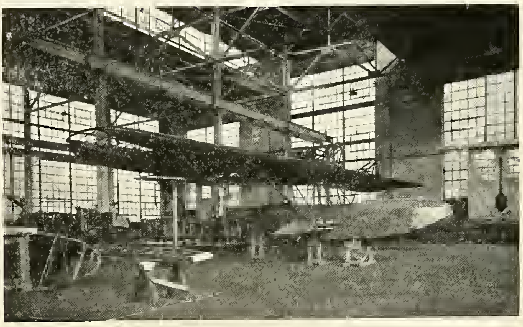


Exterior and interior views of the new Sikorsky plant at College Point, Long Island.

250 WEST 57th STREET, NEW YORK CITY
Factory, College Point, L. I. Field, Westbury, L. I.

THE HESS BLUE BIRD

THE spacious forty-two cubic foot cockpit of the Hispano Suiza engined Blue Bird seats four passengers or may be used for express or mail service. A wide door permits easy entrance for passengers and when used for cargo, facilitates loading. The center section is wide and supported by streamline tube struts unobstructed by fore-and-aft wiring.

Wing struts are of welded steel N units requiring no incidence bracing wires and facilitating alignment when setting up.

Ailerons are fitted into both upper and lower wings, interconnected with steel struts. The Clark Y wing curve is used. Wing tips are rounded off in graceful lines, making for efficiency as well as fine appearance.

Gasoline tanks having 30 gallons capacity are located in the upper wing to assure positive feed to the carburetor, lessen the risk of fire in a crash, and make more space available for pay load in the fuselage at the center of gravity.

In the wings, the former ribs have Haskelite three-ply mahogany webs with select spruce cap strips. Compression members of the wing are heavy plywood box ribs complying with Army and Navy standards. Internal drift wires are No. 9 hard wire and all fittings are special alloy aircraft steel 15 per cent in excess of wire strength. Leading edges are covered with sheet aluminum to maintain a true contour. Rib spacing ranges from eight inches in the slipstream to twelve inches on the outer bays. The spruce spars are routed, being so located as to give maximum spar efficiency. All bolts used are of special heat-treated alloy steel. Only the best waterproof glue is used and the wing panel is given two coats of spar varnish. Grade A cotton is used for covering, treated with five coats of new dope and finished with two coats of Berryloid lacquer.

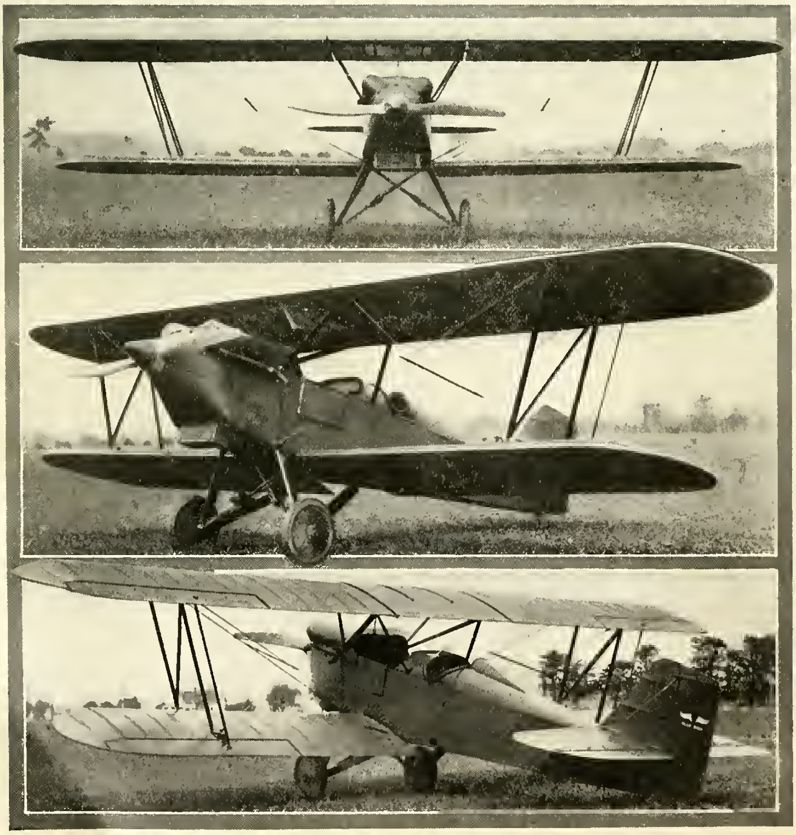
Flying wires are strand 3-16" 19 non-flexible Roebling aircraft wire and are double. All metal surfaces in the wings are protected against corrosion by Berry Brothers lionoil. Ailerons are of steel construction.

The fuselage is welded in steel jigs which accurately locate wing and undercarriage fittings in addition to all structural members. All major joints are heavily reinforced by steel gusset plates welded in. Critical members are chrome molybdenum and all others are Air Corps specification steel tubing. The engine bearers are of square seamless steel tubing.

The undercarriage struts are of chrome molybdenum tubing streamlined with balsa wood. The method of shock absorption, with telescopic steel tube members, conforms with the most modern pursuit ship practice.

The tail skid is of chrome molybdenum tubing heavily gusseted. The fin is a welded unit of steel tubing forming a very thick surface. Rudder and elevator construction are sheet steel ribs welded to alloy steel tort tubes and supported by rigid steel hinges.

Stabilizer is made of select spruce and Haskelite three-ply mahogany.



The Hispano Suiza engined Hess Blue Bird commercial four-seater.

General Specifications

Wing span, upper	33 feet 4 inches
Wing span, lower	30 feet 6 inches
Chord, both wings	5 feet
Gap between wings	5 feet 4 inches
Stagger	12 inches
Length over all	23 feet 6 inches
Height over all	9 feet 2 inches
Dihedral, lower wing	3 degrees

Weights and performances with Hispano engine are not available at this time, but the following data on the 90 h.p. OX5-motored ship gives an idea of the performances to be expected in the present ship:

Weight, light	1,275 pounds
Weight, loaded	2,050 pounds
Wing loading	6.8 pounds per square foot
Speed range	42 to 95 miles per hour
Climb first minute	400 feet
Service, ceiling	13,000 feet

NEW MICHEL ENGINES

M. AUGUST MICHEL, the proprietor of the Aviation Michel firm of Strasbourg, is a war-time pilot who afterward engaged in the reconditioning of surplus war aero engines, and also began to build engines to his own design.

Two types of engines are now made and are undergoing official tests in the French Section Technique. One of these, the AM-7, is a vertical aircooled engine with a centrifugal blower forcing air through aluminum jackets on the cylinders. The Am-5 is a 4-cylinder engine, but no information as to its form and method of cooling is available at this time.

Specifications

Type AM-5

Number of cylinders	four
Bore	130 m/m
Stroke	140 m/m
Normal b.h.p.	110 at 1,500 r.p.m.
Maximum b.h.p.	140 at 1,780 r.p.m.
Weight	130 kgs. (290 lbs.)

Type AM-7

Number of cylinders	six
Bore	128 m/m
Stroke	130 m/m
Normal b.h.p.	200 at 1,700 r.p.m.
Maximum b.h.p.	220 at 1,850 r.p.m.
Weight	230 kgs. (508 lbs.)

NEW HAVEN NEWS

THE New Haven Air Terminal, Inc., is now located on the east side of the New Haven harbor about 2,000 feet south of the first bridge. Their hangar is of steel construction, 50 feet by 60 feet, with doors that let down and form a platform in front of the hangar. A new repair shop, 18 feet by 30 feet, has just been built and equipped to handle all kinds of repair work. The railway and 25-foot runway will accommodate all types of seaplanes and can be used at all tides during the flying season. It takes only ten minutes to reach the center of the city from the hangar.

Their flying consists of passenger, photography and school work. They report quite a demand for special charter flights, a fair passenger business and a lot of instruction work. Two pupils, Raymond Goodrich and Edward Callahan are ready to fly their ships.

NEW DETROIT PLANES

A NEW organization, the Huntington Aircraft Syndicate, has been formed in Detroit to introduce a new line of commercial aircraft powered with 70 h.p. Rickenbacker engines.

The first model at present under construction, the 'Country Club,' will be of the semi-cabin variety, the pilot being seated in front in an open cockpit where best vision is possible and the two passengers seated side by side in an enclosed cabin. A three-seater 'Coupe' and 'Tourister' will also be produced along similar lines. All will be of the high wing monoplane type, wings rigidly braced to the fuselage by struts. It will be strictly up-to-date, including folding wings, dual controls, side doors and so on. This single-engined type will be marketed as the "Dwight" monoplane.

Design work has progressed well on a larger ship to be known as the Huntington "Nightingale" to be powered with three Rickenbacker engines. Construction of the first of this series will be started this month. Seating six passengers in comfort in a well appointed enclosed cabin, the plane will have sufficient cruising speed and range to make it attractive to airlines, for trail blazing or feeder line work, and also to individuals who demand increased safety, comfort and speed in travel. In fact these attributes, together with true twenty-four hour utility, are all dependent upon power plant reliability, which in turn can only be guaranteed by multiple units—hence the three engines, any two of which will develop ample power to fly and climb the ship fully loaded. A generous allowance for baggage will enable a seventh passenger to be carried on pleasure jaunts.

Advanced features will include a new and much improved type of wheel control and a simple folding wing arrangement that will enable one man to reduce the housing area required from a span of nearly fifty feet to hardly more than half the space at present required for OX5 jobs, in about ten minutes' time. The plane also will be of the usual high wing monoplane type.

Two other interesting cabin monoplanes are being constructed in Detroit. One, being built by Messrs. McCullough and Eberle, is of the folding wing type, powered with the Rickenbacker engine. It will be ready for its test hop in February. Another to be marketed as the "Curtis Wright" is being constructed by Curtis Wright. It is powered with the Wright radial Rhone engine developing approximately 120 h.p.

Both of these are four passenger cabin ships, have dual stick control in the front seats, and are of the high wing type, affording unrestricted vision below. The wings in each case are rigidly braced to the fuselage by struts.

Mr. McCullough is an expert tool maker of many years' experience, who has been interested in aviation for several years. Mr. Eberle was formerly one of the instructors in the Eddie Stinson flying school at Detroit. Mr. Wright has been a pilot and commercial operator for several years.

NEW YORK-ATLANTA AIR MAIL BIDS ASKED

BIDS have been invited for the transportation of air mail under contract over the following route: New York, N. Y., via Philadelphia, Pa., Washington, D. C., Richmond, Va., and Greensboro, N. C., to Atlanta, Ga., and return. Distance each way approximately 773 miles. Bids will be received until 12 o'clock noon February 23.

BIBLIOGRAPHY OF AERONAUTICS 1923

THIS work, published by the National Advisory Committee for Aeronautics, covers the literature published from January 1 to December 31, 1923, and continues the work of the Smithsonian Institution issued as volume 55 of the Smithsonian Miscellaneous Collections, which covered the material published prior to June 30, 1909, and the work of the National Advisory Committee for Aeronautics as published in the Bibliography of Aeronautics for the years 1909 to 1916, 1917 to 1919, 1920 to 1921 and 1922.

As in the Smithsonian volume and in the Bibliography of Aeronautics for the years 1909 to 1916, 1917 to 1919, 1920 to 1921, and 1922, citations of the publications of all nations have been included in the languages in which these publications originally appeared. The arrangement is in dictionary form with author and subject entry, and one alphabetical arrangement.

SEASON'S END SALE

FUR FLYING SUITS

FURTHER DRASTIC REDUCTIONS

U. S. Navy, Caracul Kolinsky* fur-lined, hookless fasteners, reduced from $75 to ~~$55.~~ Now $47 50

U. S. Navy, Coney* fur lined, buttoned, reduced from $65 to ~~$45.~~ Now $39 50

~~U. S. Navy, Fleece Sheep lined, hookless fasteners, reduced from $35 to $25.~~ (Completely sold out!)

These suits actually cost the Navy $250 apiece and are brand new.

Some of the above suits which have water spots are still further reduced

Still cold weather ahead, and besides this is not the last winter; our suits, when properly cared for, will last ten years

AIR TRANSPORT EQUIPMENT INC.
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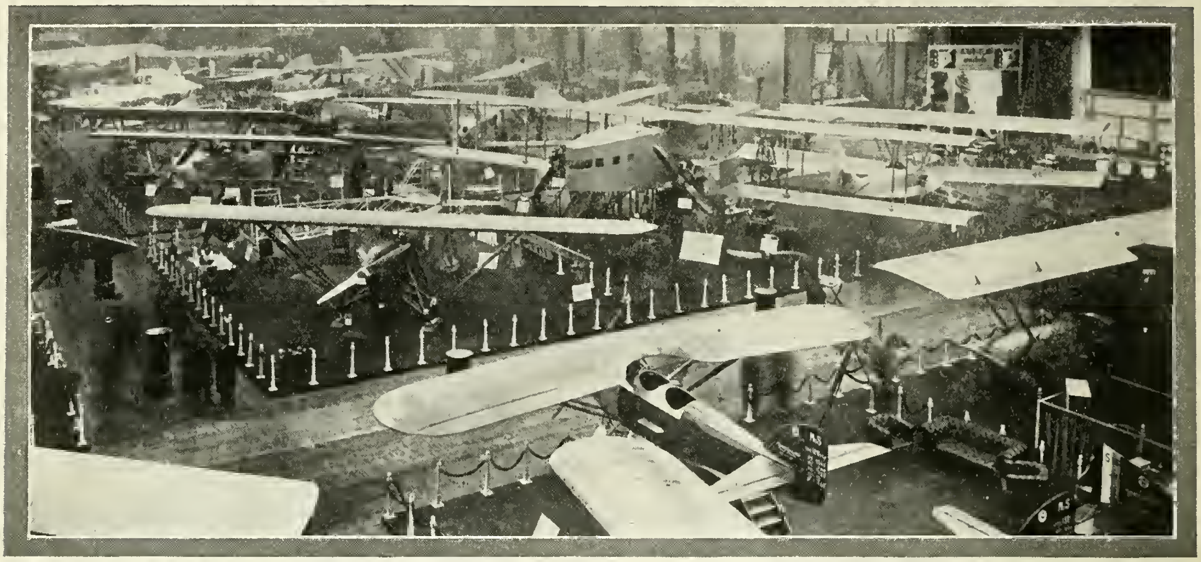
FOREIGN AERONAUTICAL NEWS IN BRIEF



The latest types of European aircraft were exhibited at the Paris Aero Show. *Herbert Photo.*

THE PARIS AERO SHOW

THE tenth Aviation Show held in Paris in December brought together the most prominent European aircraft manufactures who displayed the widest range of airplane types ever shown. In the list below (reproduced through the courtesy of the British magazine *Flight*) the characteristics of these airplanes are given. The sketches on the opposite page, from drawings by P. Soulier (courtesy of the French magazine *L'Aeronautique*) illustrate some of the novel constructional features of the planes which were on view.

Engines

The engines exhibited included the following: *Armstrong Siddeley* (England): 120 h.p. "Mongoose"; 65-75 h.p. "Genet"; 180-210 h.p. "Lynx": 400 h.p. "Jaguar".

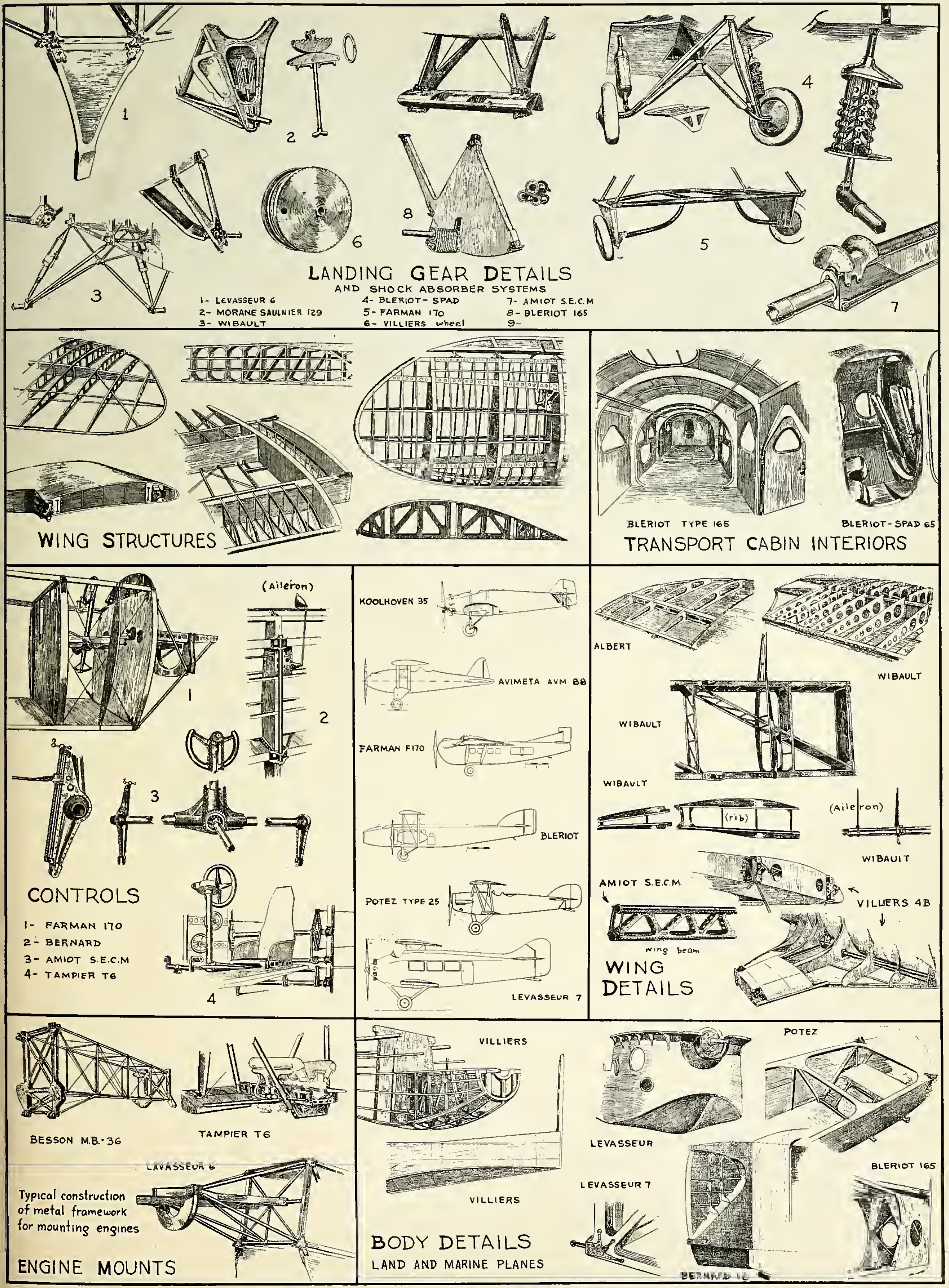
Bristol (England): 425 h.p. "Jupiter"; 120 h.p. "Lucifer"; 32-36 h.p. "Cherub". About half of the machines exhibited at the show were equipped with Bristol engines.

Breitfeld Danek I Spol (Czechoslovakia): 190 h. p. "Perun I"; 240 h.p. "Perun II"; 500

(*Continued on page 140*)

TABLE OF PARTICULARS OF AEROPLANES EXHIBITED AT THE PARIS AIR SHOW, 1926.

Machine and Type.	Purpose.	Power Plant.	Wing Span.		Wing Area.		Weight Empty.		Weight Loaded.		Power Loading.		Wing Loading.		Span²/W	"Wing Power."		Max. Speed, Ground Level.		Climb.	Ceiling.	
			m.	ft.	sq. m.	sq. ft.	kg	lbs.	kg.	lbs.	kg./h.p	lbs./h.p.	kg./sq m.	lbs./sq ft.		hp./sq m.	h.p./sq.ft.	km./h.	m.p.h.	Alt. (m.) mins.	m.	ft.
Aero Ab. 11 Bi.	2-st. Reconnaissance	240 "Perun II"	12·76	(41·9)	36·51	(393)	1,027	(2,260)	1,534	(3,380)	6·40	(14·1)	42·0	(8·60)	0·52	6·56	(0·61)	215	(130)	5,000 in 19·3	7,600	(24,900)
Armstrong-Whitworth "Ajax"	2-st. Genl. Purpose Bi.	385 A.-S. "Jaguar"	12·0	(39·3)	35·5	(382)	1,018	(2,240)	1,680	(3,700)	4·36	(9·6)	47·3	(9·68)	0·42	10·85	(1·01)	225	(140)	5,000 in 24	6,000	(19,700)
"Avimeta" A.V.M. 88 Mono.	2-st. Recon. Fighter	500 Hispano-Suiza	17·0	(55·8)	40	(421)	1,550	(3,410)	2,400	(5,280)	4·60	(10·6)	60·0	(12·55)	0·59	12·30	(1·19)	240	(149)	5,000 in 16	7,500	(24,600)
Bernard 15 C. 14 Sesqui.	Single-st. Fighter	500 Hispano-Suiza	11·4	(37·4)	24·5	(263·5)	—		1,800	(3,960)	3·60	(7·92)	73·5	(15·0)	0·35	20·40	(1·90)	270	(167·6)	5,000 in 12·5	7,500	(24,600)
Besson M.B. 35 Mono.	Submarine Scout	120 Salmson (Air.)	9·85	(32·3)	16·5	(178)	540	(1,180)	765	(1,680)	6·37	(14·0)	46·3	(9·43)	0·62	7·26	(0·67)	163	(101)	2,000 in 12	4,200	(13,800)
Besson M.B. 36 Mono.	14-pass. Flying Boat	3-420 "Jupiter"	25·0	(82·0)	130	(1,400)	5,150	(11,300)	8,000	(17,600)	6·34	(13·97)	61·5	(12·6)	0·36	9·68	(0·90)	180	(112)	—	—	
Blériot-Spad 61 Bi.	Altitude Record Machine	450 Lorraine (super.)	11·72	(38·4)	37	(398)	1,147	(2,520)	1,522	(3,350)	3·38	(7·45)	41·2	(8·42	0·44	12·2	(1·13)	283	(176)	—	12,442	(40,800)
Blériot 165 T Bi.	16-pass. Commercial	2-420 "Jupiter"	23·0	(75·4)	119	(1,280)	3,100	(6,820)	5,450	(12,000)	6·49	(14·3)	45·7	(9·38)	0·47	7·06	(0·66)	180	(112)	—	—	
M. Bondy Avia B.H. 11 Mono.	2-st. Light Plane	60 Walter	9·72	(31·9)	13·6	(146)	352	(773)	580	(1,280)	9·66	(21·3)	42·6	(6·77)	0·75	4·41	(0·41)	160	(99·5)	2,000 in 12	4,000	(13,120)
M. Bondy Avia B.H. 26 Bi.	2-st. Fighter	420 "Jupiter"	10·6	(35·5)	31·32	(337)	1,060	(2,165)	1,700	(3,740)	4·05	(8·9)	54·3	(11·1)	0·34	13·4	(1·24)	240	(149)	5,000 in 20	7,009	(23,000)
L. Breguet 19 G.R. Sesqui.	2-st. Long Dist. Recon	500 Hispano-Suiza	—		52·75	(568)	1,518	(3,335)	4,157	(9,140)	8·32	(16·3)	78·8	(16·1)	—	9·47	(0·88)	—		—	—	
L. Breguet 19 H. Sesqui.	2-st. Recon. Seaplane	450 Lorraine	14·63	(48·6)	50·0	(538)	1,350	(2,970)	2,450	(5,380)	5·44	(11·9)	49·0	(10·0)	0·44	9·00	(0·84)	200	(124)	4,000 in 30	5,600	(18,350)
L. Breguet 26 T Sesqui.	6-st. Commercial	420 "Jupiter"	—		55·0	(592)	—		2,825	(6,220)	6·72	(14·8)	51·4	(10·5)	—	7·64	(0·71)	204	(127)	—	—	
C.A.M.S. 37 A. Boat Bi.	3-st. Flt. Spot. Amph.	450 Lorraine	14·5	(47·5)	58·0	(624)	2,000	(4,400)	2,900	(6,380)	6·44	(14·2)	50·0	(10·2)	0·35	7·76	(0·72)	170	(115)	3,000 in 35	4,000	(13,120)
Caudron C. 104 G.R. Sesqui.	2-st. Long Dist. Recon.	420 "Jupiter"	14·56	(47·8)	44·0	(474)	1,377	(3,030)	1,965	(4,320)	4·68	(10·3)	44·6	(9·12)	0·53	0·55	(0·69)	209	(130)	5,000 in 28·8	6,375	(20,900)
Caudron C. 59 Bi.	2-st. School	180 Hispano-Suiza	10·25	(33·6)	26·0	(280)	700	(1,540)	1,000	(2,200)	5·5	(12·2)	38·5	(7·66)	0·52	6·92	(0·64)	180	(112)	—	—	
Caudron C. 168 Bi.	2-st. Touring	60 Salmson	9·0	(29·5)	20·0	(215)	—		584	(1,286)	9·74	(21·4)	29·2	(5·96)	0·67	3·00	(0·28)	142	(88·2)	—	3,200	(10,500)
Caudron C. 109 Mono.	2-st. Touring	40 Salmson	11·5	(37·7)	20·0	(215)	—		555	(1,220)	13·87	(30·5)	27·7	(5·67)	1·16	2·00	(0·19)	125	(77·7)	—	2,600	(8,525)
Descamps 17 A. 2 Sesqui.	2-st. Fighter	450 Lorraine	9·35	(30·7)	42	(452)	1,238	(2,720)	2,046	(4,500)	4·54	(10·0)	48·7	(9·95)	0·21	10·7	(0·99)	230	(143)	5,000 in 24·9		
Farman F. 160 B.N. Bi.	Night Bomber	2-500 Farman	26·75	(87·8)	200	(2,150)	4,000	(8,800)	7,000	(15,400)	7·0	(15·4)	35·0	(7·16)	0·50	5·00	(0·46)	186	(116)	4,000 in 30	6,000	(19,700)
Farman F. 170 T. Mono.	6-pass. Commercial	500 Farman	16·1	(52·8)	52·5	(565)	2,018	(4,430)	3,318	(7,300)	6·64	(14·6)	63·2	(12·9)	0·38	9·52	(0·88)	202	(125)	3,000 in 27·4	4,300	(14,100)
Fokker C.VD Sesqui.	2-st. Fighter	450 Hispano	12·5	(41·0)	28·6	(310)	1,290	(2,840)	1,890	(4,160)	4·20	(9·25)	65·6	(13·4)	0·41	15·6	(1·45)	255	(158)	5,000 in 17	6,700	(22,000)
Fokker F. VII-3m. Mono.	8-pass. Commercial	3-185 Armst. Sid. "Lynx"	19·3	(63·3)	58·5	(630)	2,150	(4,730)	3,600	(7,920)	6·6	(14·3)	61·5	(12·6)	0·51	9·49	(0·88)	185	(115)	3,000 in 22·2	4,700	(15,400)
Hanriot H. 35 Mono.	2-st. Training	180 Hispano-Suiza	11·4	(37·4)	22·0	(237)	600	(1,320)	950	(2,090)	5·27	(11·6)	43·2	(8·82)	0·67	9·18	(0·76)	207	(128)	—	6,500	(21,300)
Hanriot H. 41 Bi.	2-st. Training Seaplane	120 Salmson	10·26	(33·6)	34·9	(376)	725	(1,600)	1,000	(2,200)	8·33	(18·3)	28·7	(5·85)	0·51	3·44	(0·32)	120	(74·5)	—	—	
Hanriot H. 14 S. Bi.	1-pass. Ambulance	80 Le Rhone	10·26	(33·6)	34·9	(376)	—		790	(1,740)	9·88	(21·7)	22·6	(4·63)	0·65	2·29	(0·21)	120	(74·5)	—	4,000	(13,120)
Koolhoven F.K. 35 Mono.	2-st. Fighter	480 "Jupiter"	11·5	(37·7)	24·0	(258)	900	(1,980)	1,540	(3,390)	3·21	(7·05)	64·2	(13·1)	0·42	20·0	(1·86)	260	(161)	5,000 in 14	—	
Levasseur "Avion Marin" Bi.	3-st. Flt. Recon.	450 Lorraine	14·6	(47·8)	60	(646)	1,550	(3,410)	2,400	(5,280)	5·33	(11·7)	40·0	(8·17)	0·43	7·50	(0·70)	185	(115)	3,000 in 20	5,500	(18,000)
Levasseur VI C 2 Bi.	2-st. Fighter	500 Hispano-Suiza	12·2	(40·0)	40	(431)	1,200	(2,640)	1,986	(4,370)	3·98	(8·75)	49·7	(10·1)	0·37	12·5	(1·16)	215	(134)	—	7,500	(24,600)
Levasseur 7T Bi.	6-pass. Commercial	420 "Jupiter"	14·5	(47·5)	60	(646)	1,550	(3,410)	2,700	(5,940)	6·43	(14·1)	45·0	(9·2)	0·38	7·00	(0·64)	180	(112)	—	—	
Liore & Olivier LeO 21 Bi.	18-pass. Commercial	2-420 "Jupiter"	22·76	(74·6)	106·5	(11,470)	2,690	(5,920)	5,500	(12,100)	6·55	(14·4)	51·6	(11·4)	0·46	7·92	(0·73)	192	(119)	—	—	
Liore & Olivier LeO 10 Bi.	6-pass. Com. Ft.-Boat	420 "Jupiter"	16·0	(52·5)	64·2	(692)	1,700	(3,740)	3,200	(7,040)	7·62	(16·8)	40·9	(10·9)	0·39	6·54	(0·61)	170	(106)	—	—	
Loire-Gourdou-Leseurre LGL 32 Mono.	Single-seater Fighter	420 "Jupiter"	12·2	(40·0)	25·0	(269	963	(2,120)	1,370	(3,010)	3·26	(7·17)	54·8	(11·2)	0·53	10·8	(1·50)	250	(155)	5,000 in 12	9,750	(32,000)
Morane-Saulnier 129 Mono.	2-st. Training	180 Hispano-Suiza	10·7	(35·1)	19·7	(212)	740	(1,630)	1,045	(2,300)	5·81	(12·8)	53·1	(10·8)	0·54	9·13	(0·85)	—		—	—	
Morane-Saulnier 132 Mono.	2-st. Touring	120 Salmson	10·7	(35·1)	19·7	(212)	655	(1,440)	930	(2,045)	7·75	(17·0)	47·2	(9·65)	0·60	6·09	(0·57)	—		—	—	
Morane-Saulnier 35 Mono.	2-st. Training	80 Le Rhone	10·56	(34·6)	18·0	(194)	450	(990)	700	(1,540)	8·75	(19·2)	38·9	(7·94)	0·78	4·44	(0·41)	—		—	—	
Ateliers des Mureaux 3 C.2 Mono.	2-st. Fighter	500 Hispano-Suiza	15·0	(49·2)	32·5	(350)	1,170	(2,575)	1,990	(4,180)	3·98	(8·37)	61·2	(11·9)	0·58	15·4	(1·43)	245	(152)	—	8,600	(28,200)
Nieuport-Astra 42 C. 1 Sesqui.	Single-seater Fighter	500 Hispano-Suiza	12·0	(39·4)	31·75	(342)	1,379	(3,030)	1,808	(4,140)	3·62	(8·26)	57·0	(12·1)	0·37	15·7	(1·46)	267	(166)	5,000 in 13·05	8,000	(26,200)
Nieuport-Astra 48 C. 1 Mono.	Single-seater Fighter	400 Hispano-Suiza	10·0	(32·8)	19·38	(209)	1,032	(2,270)	1,290	(2,840)	3·23	(7·10)	66·5	(13·6)	0·38	20·6	(1·91)	275	(171)	6,500 in 40·23	—	
H. Potez 25 A. 2 Sesqui.	2-st. Army Co-op.	450 Lorraine	14·0	(45·9)	46·7	(502)	1,210	(2,660)	1,998	(4,380)	4·44	(9·74)	42·8	(8·73)	0·48	9·63	(0·87)	217	(135)	5,000 in 20·35	7,400	(24,300)
H. Potez 25 G.R. Sesqui.	2-st. Long. Dist. Recon.	450 Lorraine	14·0	(45·9)	46·7	(502)	1,220	(2,682)	2,365	(5,200)	5·26	(11·0)	50·6	(10·4)	0·41	9·63	(0·87)	215	(134)	—	5,800	(19,000)
H. Potez 28 G.B. Sesqui.	2-st. Long. Dist. Recon.	550 Renault	10·2	(53·2)	63·0	(688)	1,900	(4,180)	4,770	(10,480)	8·68	(19·1)	75·7	(15·2)	0·27	8·73	(0·80)	200	(124)	—	2,500	(3,200)
Salmson-Bechereau C. 2 Sesqui.	2-st. Fighter	500 Salmson	14·6	(52·8)	35·0	(377)	1,558	(3,430)	2,360	(5,180)	1·72	(10·4)	67·4	(13·7)	0·53	14·3	(1·33)	220	(137)	5,000 in 20·2	7,150	(23,500)
Salmson-Bechereau Mad. Bi.	7-pass. Commercial	500 Salmson	10·0	(55·4)	60	(646)	1,640	(4,050)	3,520	(7,740)	7·04	(15·5)	58·7	(12·0)	0·40	8·33	(0·77)	190	(118)	—	—	
Schreck-F.B.A. 21 Bi.	4-pass. Com. Fl.-Boat	450 Lorraine	15·4	(50·5)	53·5	(576)	1,820	(4,000)	2,840	(6,240)	6·31	(13·9)	53·1	(10·6)	0·41	8·41	(0·78)	186	(115)	4,000 in 56	4,400	(14,430)
S.E.C.M. 120 B.N. 2 Bi.	2-st. Night Bomber	600 Renault	19·0	(62·3)	85·0	(915)	1,760	(3,870)	3,400	(7,470)	5·67	(12·4)	40·0	(8·16)	0·52	7·06	(0·66)	200	(124)	4,000 in 38·5	5,500	(18,000)
S.E.C.M. 150 T. Mono.	14-pass. Commercial	3-350 Hispano	23·0	(78·4)	100	(1,076)	4,030	(8,875)	7,300	(16,040)	6·95	(15·9)	73·0	(14·9)	0·38	10·5	(0·96)	235	(146)	—	4,600	(15,750)
F. Villiers II Sesqui.	2-st. Navy Fighter	450 Lorraine	13·0	(42·6)	40·0	(431)	1,565	(3,445)	2,050	(4,500)	4·56	(10·0)	51·3	(10·4)	0·40	11·2	(1·04)	218	(135)	6,000 in 29	6,250	(20,500)
F. Villiers V Sesqui.	2-st. Night Fighter	450 Lorraine	12·0	(39·4)	40·0	(431)	1,274	(2,800)	2,105	(4,625)	4·68	(10·3)	52·7	(10·7)	0·34	11·2	(1·04)	224	(139)	6,500 in 43	—	
Vojenska S. 10 Bi.	2-st. Long. Dist. Recon.	450 Lorraine	15·5	(50·8)	47·0	(506)	1,200	(2,640)	2,250	(4,940)	5·0	(11·0)	47·9	(9·77)	0·52	9·56	(0·89)	225	(140)	—	6,500	(21,300)
Vojenska S. 18 Bi.	2-st. Training	60 Walter	10·0	(32·8)	17·0	(183)	254	(558)	554	(1,216)	9·24	(20·3)	32·6	(6·64)	0·88	3·53	(0·33)	140	(87·0)	1,000 in 6	3,500	(11,500)
Wibault 7 C. 1 Mono.	Single-seater Fighter	420 "Jupiter"	11·0	(36·1)	22·2	(239)	827	(1,818)	1,444	(3,175)	3·44	(7·56)	65·0	(13·3)	0·41	16·9	(1·76)	222	(138)	5,000 in 15·3	8,500	(27,900)



Sketches of some typical forms of construction seen in the latest European airplanes shown at the Paris Aero Show in December, where more than fifty types of military and commercial planes were exhibited.

(*Continued from page* 138). h.p. "BD".

Coffort Bros. (France): horizontally opposed 500 h.p. engine.

Farman (France): type 12 WE, 500 h.p.; type 18 WD, 700 h.p. The type WE has made 14 world's records during the past year.

Fiat (Italy): A-20, 410 h.p.; A-22, 590 h.p.; A-25, 900 h.p.

Gnome & Rhone (France): 80 h. p. le Rhone; 120 h.p. le Rhone; 420 h.p. "Jupiter".

Hispano-Suiza (France): 520 h.p. type 51; 487 h.p. type 50.

Isotta-Fraschini (Italy): "Asso" type, 500-550 h.p. Two other types were shown—the V6, V4B, both war-time types.

Lorraine-Dietrich (France) water-cooled types. Those shown were the 700-800 h.p.; 650 h.p.; 400 h.p.; 500 h.p.; 450 h.p. Two air-cooled types were shown, 220 h.p. and 450 h.p.

Panhard-Levasser (England): 450 h.p. type VK-122; 500 h.p. type V-12-M.

Renault (France): 450 h.p. type 12 Ja; 500 h.p. type 12Jb; 550 h.p. type 12Kg; 600 h.p. type 12Kh; 700 h.p. type 12Mc (direct drive); 700 h.p. type 12Md (geared drive).

Salmson (France) air-cooled engines: 40 h.p. type A.D.9; 95 h.p. type A.C.7; 120 h.p. type A.C.9; 230 h.p. type A.B.9; 460 h.p. type A.B.18. Two water-cooled types were shown: 260 h.p. type C.M.9; 500 h.p. C.M.18.

J. Walter A. Spol (Czechoslovakia), three types: 60 h.p., type "60"; 90 h.p., type "85"; 110 h.p. type "110".

Airplanes

Armstrong-Whitworth—The Ajax plane is a two-seater general-purpose plane. May be used as a two-seater fighter. The landing gear is of the type in which the alighting shock is taken by an oil buffer which absorbs the impact and prevents bouncing.

Avimeta—The AMV is produced by the Societe Pour las Construction d'Avions Metallique "Avimeta" of France. This machine is a semi-cantilever monoplane entirely built of the Schneider light alloy, Alferium.

Bernard—The Bernard (Ferbois) Co. is also designated by the initials SIMB. The type 15 C1 is a single-seater fighter with plywood-covered wings. The body is also of plywood. Two wing guns and fixed synchronized machine guns are carried.

Besson MB-35 and 36—Marcel Besson & Co. of France exhibited a 3-engine monoplane and a submarine scout for stowing aboard submarines. The wings on the latter machine may be dismantled in ten minutes.

Bleriot—The Spad 61 monoplane broke the altitude record. The wings have duralumin spars and interplane struts. The Bleriot type 165 is a twin-engined version of the type 155 four-engined transport plane.

Breguet—Breguet exhibited 3 machines. The type 19GR holds the record for straight-away long distance. The type 19H is a reconnaissance and bombing seaplane. The type 26T is an adaptation of the type 19 to the requirements of commercial aviation.

C. A. M. S.—The firm of Chantiers Aero-Maritimes de la Seine of Paris exhibit a 3-seater fleet spotting amphibian.

Caudron—The Caudron C. 104 is a strut-and-wire braced sesquiplane. It carries full military equipment including four machine guns, internal bomb racks, electrical heating and lighting installation, signal flares, oxygen apparatus and parachutes.

Descamps—The type A. 2 is a sesquiplane built entirely of duralumin, including covering of the wings and body. The undercarriage has streamline mudguards.

Farman—The type F. 170 is the latest machine of its class produced by Farman. It has been produced as a result of extensive experience gained on the Paris to Amsterdam air line. This plane is regarded as possessing unusual merit. The type F. 160 night bomber is provided with two 500 horsepower Farman engines. F. 160 can also be fitted as a torpedo plane provided with twin floats. The naval torpedo-dropping version of the Goliath is known as the F. 150.

Fokker—This well known Dutch airplane manufacturer presents the commercial 3-engined plane similar to the North Pole plane, and the type C. V. fighter which may be flown with any one of a number of engine types.

Hanriot—This firm produces planes particularly suited for training purposes and used in numbers by the French Government. The H. 35 type is of composite structure; wings have duralumin tube spars and compression members with wooden ribs. The body longerons and cross pieces are built of duralumin tubes as is also the landing gear. The navy version of this same type is the H. 41, a twin-float biplane. The H. 41 S ambulance airplane was used extensively during the recent campaign in Morocco.

Koolhoven—A feature of the type F. K. 35 is that it may be converted from monoplane to biplane as desired. The fuselage is of metal tubular structure. The wing is of wooden construction with plywood covering.

Levasseur—The shipboard reconnaissance airplane belongs to the class of airplanes designated in France as "avion marin" which does not mean a seaplane, but a "seagoing airplane." Such planes in the French Navy are used both for shipboard and coastal service, which requires that they have the ability to alight on the water in an emergency. The type VIC. 2 is a two-seater fighter resembling the shipboard plane. It has a type of body possessing a remarkable resistance to atmospheric variations. The Type 7T transport plane has wings which may be folded for stowage.

Lioré et Olivier—The Olivier firm was the only company exhibiting no military planes. Their transport airplane will be used on the Paris-London service of the Air Union. The framework of this plane is of duralumin.

Loiré-Gourdou-Leseurre—The LGL present two single-seater fighters and an ambulance airplane. The ambulance plane is provided with one service stretcher, complete first-aid equipment, an oxygen inhalator and electric heating.

Milos Bondy A Spol—The Avia BH 11 airplanes are used exclusively in the Czechoslovakian Army for training purposes equipped with a 60 h.p. Walter engine.

Morane Saulnier—Type 35 E. P. 2 is used for elementary training. The next step in this series of planes is type E. T. 2 advance training plane. Type 135 Touring airplane is adapted from the previously mentioned types but with a lower power engine.

Ateliers Des Mureaux—The "Express Marin" is a tractor monoplane fitted with a water type stepped hull for alighting on water. To facilitate this maneuver the nose of the body is flared out into wing-roots. The undercarriage may be released when the pilot wishes to discard it in landing on water.

Nieuport-Astra—The body of type 42 C. 1 is built in two halves, split along the horizontal; built up of strips of wood on spruce longerons. The forward portion of the body is reinforced by a framing of riveted sheet duralumin which is bolted to the monocoque skin. Type 48 C. 1 light fighter is similar to the above, except that it has no lower wing. The wing bracing struts and undercarriage are built of riveted sheet duralumin.

Potez—Type 25 G. R. is of the type used by Captain Doisy in his 6,500-km. flight around the Mediterranean. The same machine was used by Captain Arrachart and Engineer Carol on their circuit of the European capitals a year ago last August when they covered a distance of 8,000 kms. within three days. The type 25 A. 2 plane may be used for long distance bombing or observation. It is armed with four machine guns and racks for carrying twenty-four bombs.

Salmson-Bechereau (S. R. A. P.)—The type C. 2 two-seater fighter is a strut-braced monoplane constructed on conventional lines. This company also produces a mail airplane.

Schreck—The F. B. A. Co. has specialized on flying boats since 1912. They exhibited the type 21 transport amphibian flying boat which won the world's seaplane altitude record with 1,000 kg. of ballast. The type 21 has a retractable landing gear. This flying boat is of excellent streamline form. It may also be equipped as a reconnaissance bomber or as an ambulance seaplane.

S. E. C. M.—The S. E. C. M.-Amiot 120 is a two-seater night bomber. The type 150 T is a cantilever monoplane with three engines. Both of these machines are of all-metal construction.

Vojenska Tovarna Na Letadla—The Vojenska type S 16 is of all-metal construction except for the fabric covering. The body is of steel tube construction. Type S 18 is a 60 horsepower school machine. The type S 20 single-seater fighter is of steel tube and duralumin construction.

Villiers—The Villiers type II naval two-seater fighter was specially designed for fighting heavy flying-boats with the advantage of incorporating the features of a landplane but having also the ability of alighting safely on water. It is a "seagoing aeroplane" which is particularly adapted to use on board aircraft carriers.

Wibault—The Wibault 7 C. 1 is entirely built of duralumin, the fuselage being built up of angle sections and strips while the wings have duralumin tube spars and ribs of the same alloy. Both the wings and the fuselage are covered with sheet duralumin, which is applied in small strips and secured to the framework with a patented metal seam. This construction allows of rapid and easy repairs. The landing gear is of the axleless type with oleo-pneumatic shock-absorbers.

SOUTH AMERICA

THE cornerstone for the first airplane factory in Argentina was laid on November 10, 1926, at the city of Cordoba, Province of Cordoba. The factory is semi-official in character, its first purpose being to assure independence of imported air equipment in times of war. The factory will, however, in normal times construct planes for civilian customers as well as for the army.

The Argentine government has acquired patent rights for Lorraine Dietrich motors, which for two years will be only assembled in Argentina. The first planes will be of the Breguet type with landing gear only. This plane has already met with considerable success in Argentina.

THE Argentine Aerotechnical Institute was founded at Buenos Aires on December 14, 1926. This new and purely scientific institution will seek to promote the independence of Argentina in the field of aeronautical engineering. It will also work for the establishment of factories of aerial and experimental material, at the same time disseminating information relative to areonautics by means of public lectures.

THE Junkers Mission, which operates a tri-weekly airplane passenger and transport service between Buenos Aires and Montevideo, has replaced the single motor hydroplane formerly in use with a triple-motor hydroplane, with capacity for 10 passengers instead of four, as in the machine previously used.

SENOR O. E. MEYER, who intends to organize an aviation service in Rio Grande do Sul, has sailed for Germany where he will purchase material necessary for this service. He will return in May, 1927, with two airplanes of 460 h.p. and capable of transporting 10 passengers, in addition to the crew. The lines to be operated are: Porto Alegre to Pelotas and Rio Grande; Porto Alegre to Santa Maria; Porto Alegre to Praia de Banhos and cities along the coast.

THE Compania Mexicana de Aviacion, of Tampico, has made 1,450 trips with a total mileage of 286,000 kilometers from the time of the organization of the company on October 1, 1924, to November 30, 1926. This is the only aviation company in Mexico doing regular commercial flying. The company now has four planes in service, all of which are Lincoln Standards equipped with Hispano-Suiza motors.

THE regulation of civil aviation in Argentina was established recently by the promulgation of an executive decree. The regulations affect the ownership and operation of airplanes, the licensing and qualifications of pilots, the conduct of aviation schools, and similar matters.

The licenses of airplane civil pilots will be granted by the Aero Club Argentino, visaed by the Department of Civil Aviation of the Aeronautical Service of the Army.

ENGLAND

SIR SAMUEL HOARE, British Secretary of State for Air, and Lady Hoare arrived at Delhi, India, on schedule time, January 8, completing their air voyage from England, 6,300 miles, in 63 flying hours. They left England on December 27, and met with only one day's delay—having to return to Jask owing to a severe storm—which was made up by a shortened stay at Karachi.

ANOTHER fine achievement of British airmen was that of B. S. Leete and Neville Stack, two members of the Lancashire Aero Club, who arrived at Karachi, India, from England, January 8, in two D.H. Moths. They flew 5,500 miles over mountains, sea and desert, following approximately the same route as that taken by the "Hercules" carrying Air Minister Hoare and his wife. The pilots left England November 15, without any fixed schedule and with no ground organization, each man acting as his own mechanic.

IT is reported that three types of racing seaplanes are now under construction for the British Ministry with a view to providing a British entry for the 1928 Schneider Cup Races. The best known of these, designated as the S-5, is very similar to the Italian Macchi and is powered with a Napier engine known as the "broad-arrow" type.

THE Air Ministry has published what should be known as "The Air Pilot's Bible," so complete is the mass of detail supplied to pilots regarding flying conditions in any part of the country and at every aerodrome. "The Air Pilot of Great Britain" is to be kept up to date by the issue of monthly supplements.

CZECHOSLOVAKIA

THE IVth International Aeronautical Exhibition will be held in Prague from June 4th to June 16th, 1927 under the auspices of the President of the Czechoslovak Republic.

EFFORTS are being made in Czechoslovakia to develop the capital city, Prague, into a junction point for inter-central European air lines. Negotiations are reported already to have been concluded with Great Britain relative, in principle, to the proposed London-India line via Czechoslovakia.

FRANCE

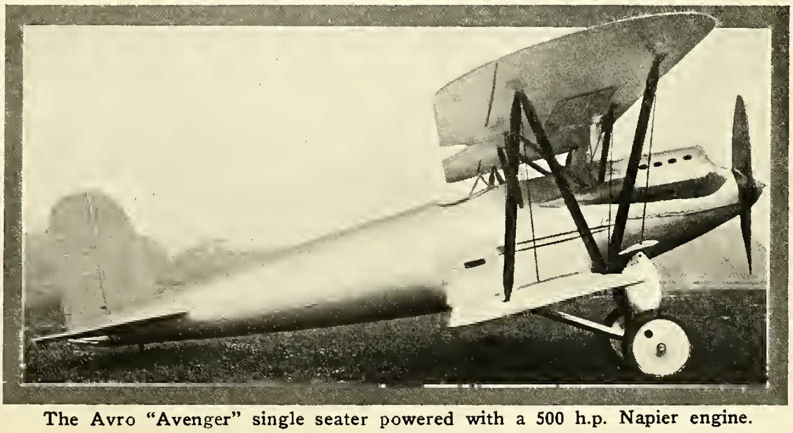
AN aviation beacon of 1,000,000,000 candlepower was put into service on Mount Valerien, a high hill just west of Paris, on November 30, 1926. It is said to be the most powerful in the world. The beacon will signal to a distance of 60 miles, and serve as an aviation lighthouse for the entire Paris region. It contains two mirrors, each more than six feet in diameter, and two arc-lamps. It was constructed under the direction of the French aeronautic technical service.

THE Tunis-Antibes air service was inaugurated on November 26, 1926, with the arrival of the first hydroplane of the company "Societe Aeronavale." The plane was a Lioré et Olivier with 450 h.p. Gnome-Rhone motor, and the flying time was six hours and forty-five minutes. It is planned to begin with one flight a week.

TO demonstrate the feasibility of using seaplanes to transport mail and passengers between France and Madagascar, Lieut. Bernard of the French Navy recently completed a flight of over 20,000 miles in a hydroplane, covering the distance from France to Madagascar and return. The plane used was a Lioré et Olivier, driven by a Gnome-Rhone "Jupiter" 450 h.p. engine. Crossing Africa, Lieut. Bernard followed the principal waterways, wherever possible, until he reached the Indian Ocean. The flight started on October 18 and was completed January 6.

INCREASED attention is being given in France to projects for a series of internal aviation lines, connecting principal cities. With Chambers of Commerce actively interested study is under way of lines to connect Geneva and Bordeaux via Lyon and Clermont-Ferrand; Paris and Douai, and Toulouse and Paris.

A recent visit of French authorities to Germany, and the report they brought back of the network of internal air lines which cover that country from one end to the other have apparently aroused the French to new efforts. Success of international trunk lines, of which France has four, is pronounced dependent upon an efficient system of feeder lines, in which France thus far has been very deficient.



The Avro "Avenger" single seater powered with a 500 h.p. Napier engine.

Picked from the Air

AERO DIGEST will award a prize of $5 each month for the best humorous contribution published. Only those pertaining to the aircraft field will be considered. Address the "Picked From The Air" Dept., Aero Digest, 220 West 42nd Street, New York, N. Y.

Mrs. A. K. "Wings" Dean, Portland, Oregon, won the prize for February.

An air pilot was having difficulty in explaining a slip of paper his wife found in his pocket. On it was written "Minnie B.412."

"That's just the nickname of a ship and its number, like 'Jenny 4 D 2,'" he said.

Believing him she smiled and kissed him.

The next time he came home she landed on him, like a DH out of control. When he came to, she explained, "The ship called up!"

Traffic Judge, 1950:

"Wrong side of the cloud, eh? Fifty dollars and costs."

—*Baltimore Sun.*

May: "What do you suppose has happened to Cliff lately, that makes him so stuck up?"

Day: "You know, he's an aviator now, and he thinks he is above us."

There was almost a fatality at Croydon (Eng.) Airdrome recently, when the Imperial Airways new fleet was delivered, for as the good ship G-EBMT taxied up to the line, a bystander was heard to remark to a friend, "Blimey! That 'un can't carry no passengers!" The unwary friend promptly "bit," asking, "Well why not?" "Why, so it says on the side, 'e be empty!!"

—*William Stull, Jr.*

Pat and Mike at a country fair were watching their first aeroplane.

"But what kapes it up," said Pat.

"Ah, Pat, an 'tis little ye know of the terrible force of gravitation," was the answer.

—*E. W. Hutchinson.*

I entered a leading book shop in Montreal and inquired if they had "The First World Flight," by Lowell Thomas. The clerk who was by origin French, looked through the book list and said, "Sorry, Madam, we have not 'The First World Flight.' Would the second or third do?"

—*Elena H. Estenez.*

Keep Off the Stars

In days when flying flivvers
Dart here and there in schools,
We'll have to regulate them
Through new air-traffic rules.
In lieu of "cutting corners,"
Which now is not allowed,
We'll have an air rule reading:
"You must not cut a cloud."

—*Boston Transcript.*

Kind Old Lady: "Isn't it required that you pilots have a license to fly?"

Young Pilot: "Yes, mam."

Kind Old Lady: "And how long are they good for?"

Young Pilot: "God only knows."

—*Harry M. Gritsl.*

We suggest that when the aircraft manufacturers take to selling planes to the public in quantity they adopt as a slogan that popular old saw: "Plane as an old shoe."

—*Kenneth D. Stern.*

Corp. Langston (trying to start his engine): "This darn thing won't start. There must be a short circuit in the starter."

She: "Why don't you lengthen it, dear?"

A clothing store ad showed what the "gentleman aviator" will wear this season. Nothing said about what the other boys will wear!!!!

An exhibition aviator once flew at a fair. An old farmer paid him ten dollars to take his young daughter up for a ride. They got in and the pilot said to his mechanic: "Give 'er the gun."

The old farmer ran out and pulled his daughter from the plane, exclaiming:

"No you don't! She wuz jest acquitted las' week from killin' her husband!"

"Jones fell like an aviator."

"How's that?"

"Oh, he didn't BANK enough!"

Aviator: "No matter how hard I tried, I just couldn't get up this morning."

Mechanic: "Too much last night, eh?"

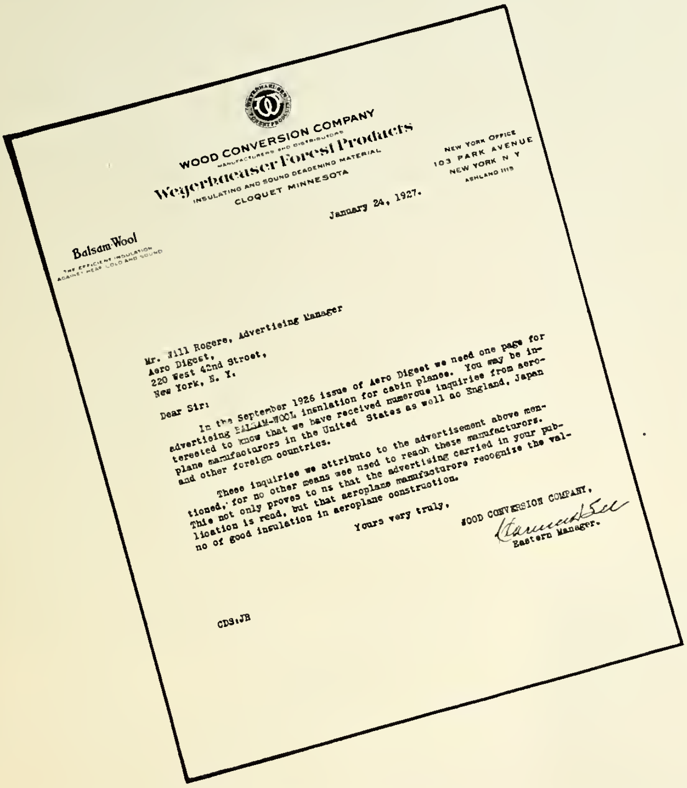
Aviator: "No—just had engine trouble!"

"Why did Susie marry the parachute jumper?"

"Oh, he just glided into her affection."

—*Mont Hurst.*

Selling a new idea to the aircraft industry



WOOD CONVERSION COMPANY
MANUFACTURERS AND DISTRIBUTORS
Weyerhaeuser Forest Products
INSULATING AND SOUND DEADENING MATERIAL
CLOQUET MINNESOTA

NEW YORK OFFICE
103 PARK AVENUE
NEW YORK N Y
ASHLAND 1113

Balsam-Wool
THE EFFICIENT INSULATION AGAINST HEAT COLD AND SOUND

January 24, 1927.

Mr. Will Rogers, Advertising Manager
Aero Digest,
220 West 42nd Street,
New York, N. Y.

Dear Sir:

In the September 1926 issue of Aero Digest we used one page for advertising BALSAM-WOOL insulation for cabin planes. You may be interested to know that we have received numerous inquiries from aeroplane manufacturers in the United States as well as England, Japan and other foreign countries.

These inquiries we attribute to the advertisement above mentioned, for no other means was used to reach these manufacturers. This not only proves to us that the advertising carried in your publication is read, but that aeroplane manufacturers recognize the value of good insulation in aeroplane construction.

Yours very truly,

WOOD CONVERSION COMPANY,
Eastern Manager.

CDS:JB

AN example of the manner in which our reader-audience responds to new ideas is shown in the number of inquiries received following the introduction of Balsam Wool through Aero Digest.

The story of the response is told in the letter reproduced here.

Whether your product is new to the aircraft industry or already established you can create a demand for it through the one DOMINATING aircraft medium—

AERO DIGEST

FIRST in readers' interest
in sworn circulation
in paid advertising

AERO DIGEST, 220 W. 42nd Street, New York, N. Y.

AIR—HOT AND OTHERWISE

(Continued from page 88)

You and I already know and everybody else is beginning to find out that the bureaucrats in Washington, although they might find much useful public work to do are not always thus employed, but, instead, spend much time industriously striving to make their own soft couches softer.

Knowing this, we of AERO DIGEST say it. That's where we differ from the pussyfooters.

If we lose a little advertising because we voice this truth, we shall accept the situation with a perfect calm.

And keep on voicing truth.

In their hearts the very advertisers who are being used as tools admire us now far more than they did before we stirred the wrath of certain elements in Washington; and as time goes on they will admire us more. For we shall play quite square with them, and everybody—including the American people, who are entitled to some words of warning with regard to a most dangerous, a deeply and profoundly dangerous, betrayal of their trust by various officials of this Government whose training at the people's expense and position in and responsibility for our first line of defense, should make them quite familiar with the fact that there is moral treason which, although it is not technical and cannot be considered by court-martial, should be as abhorrent to a gallant sailor's soul as that bare and ruthless type of treason which by statute means a firing squad.

It is as horrible to sell your nation's welfare for an opportunity to drag down a bigger departmental pay-check from the Treasury, as to sell it for a secret bribe passed slyly over by a foreign enemy.

We in the office of AERO DIGEST are going to represent the air-interests of this nation fairly and squarely whether or not this pleases a few bureaucrats in Washington, some special advertisers elsewhere, or anybody else with a particular axe to grind. We, ourselves, have no axes that need grinding;. all ours are sharp. We won't be browbeaten, we won't be driven into silliness or choked to silence by bureaucratic wrath. We'll keep our heads screwed tight to our shoulders and the eyes in them wide open.

Among the things which we here in this office are resolved to do, if necessary, is to shed every last drop of the blood now flowing in our veins and arteries to serve the interests of the manufacturers, on the one hand, of the men who fly the ships, on the other hand, and of the American people on both hands. If we do this we shan't lack advertising patronage . . . or circulation . . . or real, honest-to-God influence with the American people—the only place where influence is worth a whoop.

THE most recent example of how some officials disregard the law may be found in the following correspondence between AERO DIGEST and the Navy Department concerning the matter of bids for training planes. Perhaps we had better print the law first:

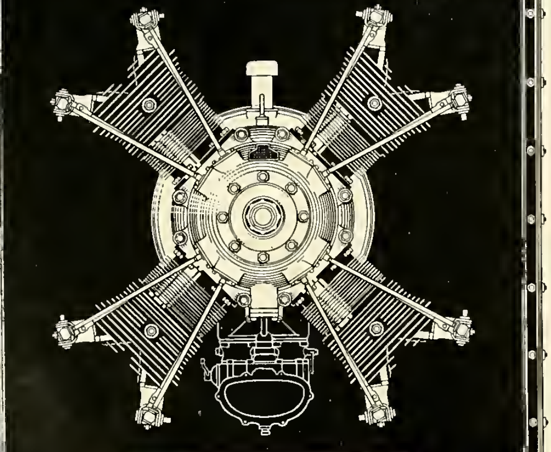
HOUSE BILL 10827

Public—No. 446—69th Congress

(An Act to provide more effectively for the national defense by increasing the efficiency of the Air Corps of the Army of the United States and for other purposes.)

Section 10—Paragraph A—Page 5:

That in order to encourage the development of aviation and improve the efficiency of the Army and Navy aeronautical material the Secretary of War or the Secretary of the Navy, prior to the procurement of new designs of aircraft or aircraft parts or aeronautical accessories, shall, by advertisement for a period of thirty days in at least three of the leading aeronautical journals and in such other manner as he may deem advisable, invite the submission in competition, by sealed com-



RELIABILITY

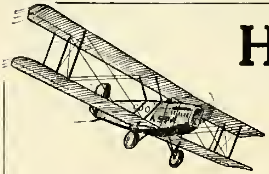
A FAIRCHILD AVIATION PRODUCT

The Fairchild-Caminez is not an experimental engine. The first model was run at McCook Field in May, 1924. The engine has had nearly three years of intensive testing and refinement, both in the test laboratory and in the air, in order that there could be no question as to its reliability.

Fairchild-Caminez Engine Corp.
Farmingdale, Long Island, N. Y.

FAIRCHILD
Caminez
CAM ENGINE

GIVES MORE SERVICE REQUIRES LESS



Home Study in Aviation

A BABY CREEPS, BEFORE IT WALKS, and before a person attempts to fly, he or she should have a thorough knowledge of the fundamentals of aviation.

It is with this idea in view that The American Society for Promotion of Aviation has arranged its home study course.

The course has been arranged by men of actual flying experience; is based on lessons taught by the Army Air Service, and the experiences of men in the air.

The course covers EARLY HISTORY OF AVIATION—GLIDING—THE WRIGHT BROTHERS AND EARLY AVIATION IN AMERICA— TYPES PAST AND PRESENT—BALLOONS AND DIRIGIBLES—TYPES AND DIVISIONS OF TYPES—COMMERCIAL FLYING—FUNDAMENTALS OF THE SCIENCE OF FLIGHT—RELATIVE MOTION—NEWTON'S LAWS OF MOTION—NATURAL STABILITY—CENTER OF PRESSURE AND CENTER OF GRAVITY.

THE AEROPLANE IN GENERAL—TYPES AND PARTS—WING STRUCTURE—BODY STRUCTURE—STABILITY—NOMENCLATURE—STREAMLINING.

ASSEMBLING — ERECTING — ALIGNING — ANGLE OF INCIDENCE— TURNBUCKLES—CARE OF AIRPLANES, TOOLS AND HANGARS— TRUEING UP PLANES—COVERING AND DOPING—ADJUSTING OF AILERONS AND FORE AND AFT BALANCE—CHECKING ALIGNMENT OF FUSELAGE—PROPELLER TORQUE—NOTES ON WOOD SPLICING.

INTERNAL COMBUSTION ENGINE—CARBURETORS—MAGNETOS— LUBRICATION—TROUBLE SHOOTING.

AIR CONDITIONS—NAVIGATION—ON THE FIELD—ACTUAL FLYING —CROSS-COUNTRY FLYING—AND TWENTY-FIVE QUESTIONS TO BE ANSWERED FROM YOUR STUDY OF THE COURSE.

THE PRICE OF THIS COURSE COMPLETE WITH BLUEPRINT OF AIRPLANE IS

$5.00

Send check or money order or write for information.

THE AMERICAN SOCIETY FOR PROMOTION OF AVIATION
522 Fifth Ave., New York City

munications, of such designs of aircraft, aircraft parts, and aeronautical accessories, together with a statement of the price for which such designs in whole or in part will be sold to the Government.]

When the time for the submitting of designs expired at midnight December 21, 1926, we, being of an inquisitive nature, were anxious to learn what magazines had been selected under this law, so we queried the Navy Department on the subject under date of January 7 and received the following reply:

NAVY DEPARTMENT
Bureau of Supplies and Accounts
Washington, D. C.

10th January 1927.

AERO DIGEST
220 West 42nd Street
New York City
N. Y.

SUBJECT: Advertising
Reference: Your letter of 7 January 1927

Sirs:

The following periodicals were selected by the Secretary of the Navy for advertising the purchase of the training planes to be made in the near future:

Aviation
U. S. Air Service Magazine
National Aeronautical Association Magazine

Respectfully,
(Signed) R. J. MONTEITH,
By direction of the Paymaster General.

Then, when a very thorough examination had failed to reveal the advertisement in the *National Aeronautic Review*—yes, in our earnestness of search we even read the *National Aeronautic Review*—we again put a query to the Navy under date of January 14:

MR. R. J. MONTEITH,
Navy Department,
Bureau of Supplies & Accounts,
Washington, D. C.

Dear Sir:

Referring to your favor of January 10th, upon search made in the N. A. A. magazines, we fail to find the advertising covering the purchase of the training planes. Will you advise us the month in which this advertisement appeared?

Very truly yours,
AERO DIGEST
By Frank A. Tichenor

In reply to this we received the enlightening communication upon Navy Department stationery:

January 17th, 1927

AERO DIGEST,
220 West 42nd St.,
New York City, N. Y.

SUBJECT: Airship design competition 1927.
Reference: Your letter 14 January 1927.

Sirs:

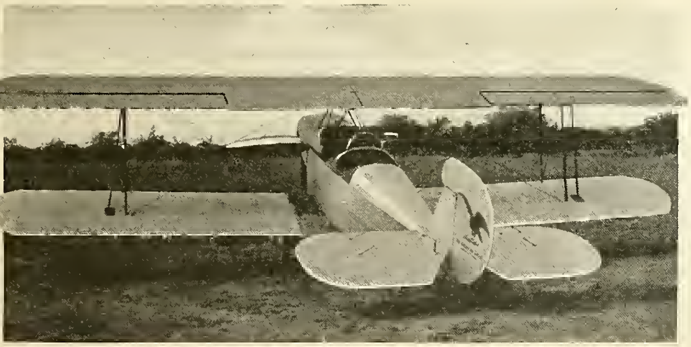
Upon further reference to your letter of 7 January 1927, it is noted that you request information as to what magazines were used to advertise bids for training ships that are about to be opened. It is believed you have reference to airship design competition which will be opened during the month of May. You are advised that the Secretary of the Navy has selected the following media for advertising this competition:

U. S. Air Service Magazine
Aviation Magazine
Slipstream

In this connection you are advised that all advertising is placed by the Secretary of the Navy.

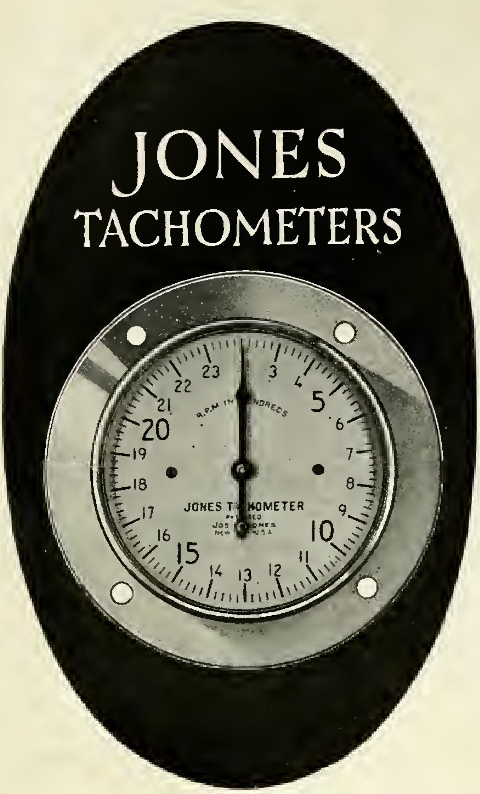
Respectfully,
(Signed) B. M. DOBSON
By direction of the Paymaster General.

(Continued on next page)



AN American Eagle A-1 has just completed a two week demonstration tour of eight states. During this tour three state distributors were appointed. We challenge performance contests with any make OX5 motored plane. Our refinements and special features are second to none. Orders are being received for March and April delivery. Let us tell you about our liberal distributors contract.

AMERICAN EAGLE AIRCRAFT CO., 2330 Harrison St., Kansas City, Mo.



USED UNIVERSALLY

JONES Tachometers are used exclusively as standard equipment by the commercial manufacturers producing the majority of America's aircraft.

Also exclusively by the Navy Department on all airplanes where a circular scale instrument can be installed.

JONES Tachometers have maintained their lead everywhere because they have no equal.

A booklet describing the several types will be sent on request.

CONSOLIDATED
INSTRUMENT COMPANY
OF AMERICA, *Inc.*

41 East 42d Street, New York City

(Continued from preceding page)

One may infer from the above that the Navy was most anxious to supply the information we had asked for. The Navy always will coöperate with the tax payers when it is possible to help them spend their money.

But we of AERO DIGEST have such troublesomely persistent minds. We were not entirely satisfied with this reply. We wrote again, under date of January 20, as follows:

> Navy Department,
> Bureau of Supplies and Accounts,
> Washington, D. C.
>
> Attention Mr. B. M. Dobson
>
> My dear Sir:
>
> Referring to your letter of January 17 in reply to ours of the 14: apparently we were not thoroughly understood. What we wish to know is the date of "The National Aeronautic Review" in which the bid was advertised for the training plane competition on which the time for submitting designs closed at midnight on December 21, 1926.
>
> In your letter of January 10, you state that "Aviation," "U. S. Air Service Magazine" and "National Aeronautical Magazine" contained the advertising for the purchase of the training planes and we have been unable to locate the advertisement in "The National Aeronautic Review."
>
> Any information that you can give us will be appreciated and an early response will likewise be appreciated.
>
> Very truly yours,
> AERO DIGEST
> By Frank A. Tichenor

This time we were passed over to the Secretary of the Navy in the following manner.

> AERO DIGEST
> 220 West 42nd Street
> New York City
> N. Y.
>
> SUBJECT: Advertising
>
> Sirs:
>
> Receipt is acknowledged of your letter of 20 January 1927.
>
> Inasmuch as the Secretary of the Navy has cognizance of all matters pertaining to advertising, your letter has been referred to that office.
>
> Respectfully
> (Signed) B. M. DOBSON
> By direction of the Paymaster General.

Up to the time of going to press, January 25, we have heard from the office of the Secretary of the Navy—nothing.

Now the fact is that the law was *not* complied with. The *National Aeronautic Review* did not carry the advertisement. Two magazines did. The law commands three. Here is an utter disregard of the law by the Navy Department.

Gentlemen of the Senate and House of Representatives, what are you going to do about this and all the multitude of similar episodes? Are we to be governed by the laws you make and allow the Secretary of the Navy and the Navy Department to disregard them?

While AERO DIGEST is by far the leading periodical connected with American aviation, at least as far as circulation goes, having more than double that of its nearest competitor, we really didn't expect to receive nor do we want the patronage of the Navy Department as it is now administered, but we do expect obedience to the law by the executives of all Washington Departments. Presently someone will do more than expect it; someone will DEMAND it.

Here is something for our Congress to ponder over for a moment and then act upon.

REPRESENTATIVE McCLINTIC (Dem.) of Snyder, Okla., and a member of the House Committee on Naval Affairs, has issued a statement declaring that a Japanese war scare is being definitely put forth in propaganda by the Navy "to excite American citizens in favor of a four or five hundred million dollar ship building policy."

Mr. McClintic has examined matters with a disconcerting thoroughness, and especially protests against the alleged refusal of Secretary Wilbur to allow members of the committee sight of Admiral Gleaves' report "regarding the belligerent attitude of Japan a few years ago."

This report was made the excuse for secrecy with regard to the disposition of Naval Reserve oil lands and the construction of oil tanks in Hawaii. After the acquittal of Messrs. Fall and Doheny one of the jurors revealed the fact that the reason the trial resulted as it did was "the Japanese war scare."

But members of Congress, in other words the people, are denied the facts by the Navy. It is obvious to Congressman McClintic that if this continues officers of the Navy soon will be able to adopt any policy they choose, without criticism, whether that policy be right or wrong.

This, Congressman McClintic thinks, might be bad business, and turns back the pages of the nation's history to the time when the U. S. Ship *Washington* was sunk in accordance with the agreements reached at the Disarmament Conference.

Sad reading, that! A spokesman of the Navy gave the newspapers accounts of the great quantities of explosives which had been dropped by airplanes on this ship without effect. Later it developed that these reports were false. "Therefore," says Congressman McClintic, "it can be deduced that certain officers in the Navy purposely deceived the American public."

Brethren of the Navy, this is really bad business. And if that be treason take away some more of AERO DIGEST'S advertising.

Congressman McClintic continues with such other words of wisdom and truth as make us feel that he indeed is fortunate in not being the proprietor of any publication from which the Navy could remove fractions of annual income. After what he's said the Navy bureaucrats would remove from him his very shirt, I fancy, if they had any means of thus disciplining him.

He further states that even if the Japanese attitude were all that has been claimed, "I should much prefer to spend the money for airplane carriers, and bombing and other types of planes, for everyone knows that, unless this nation should adopt a policy of conquest, no nation on earth can land an army on its shores or do damage to its citizenry if we but have an adequate air force."

He dares to say that the Navy built the Japanese scare out of whole cloth for the purpose of abstracting money from the public pocketbook through appropriations.

SO perhaps, after all, if aircraft manufacturers will take the long instead of the short view, they may see that they might be engaged more profitably than in helping the Big Navy advocates who want to spend the nation's cash on armorplate and heavy guns, doubtless fine in 1898, but to spend not a red cent more than human progress forces on the new weapon, aircraft, essential in 1927. That's why the manufacturers who back the Navy bureaucrats surprise us. They don't make armorplate, they make planes.

So, everything considered, everyone considered, and the whole thing thought out to the best of our ability, we are moved to state without a trace of tears that—

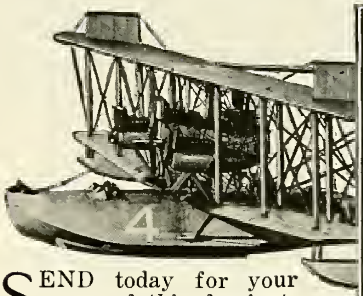
AERO DIGEST, gentlemen, stands pat.

FREE!

"How to Fly"

by Lieut. Walter Hinton

Pilot of the NC4



SEND today for your copy of this fascinating book on aviation absolutely *free!* Learn how YOU can enter this fast growing, big paying, adventurous profession.

Become a *pilot*, a skilled airplane mechanic, a designer, a rigger, inspector or an aeronautical engineer. There is big money in *all* branches of aviation. Big money for *you*.

Lieut. Walter Hinton, the famous pilot of the N.C.4, the first plane to fly across the Atlantic Ocean, teaches you in your own home!

Prepare Yourself for a High-salary Job in Aviation

The most fascinating profession in the world—flying! Your earnings are almost limitless. Lieut. Walter Hinton teaches you in your spare time. Mail the coupon at once for particulars and "How to Fly" by the famous pilot himself.

Aviators Preparatory Institute
475 Fifth Ave., Dept. 62,
New York City

Aviators Preparatory Institute, Dept. 62
475 Fifth Ave.,
New York City, N. Y.

I'd like to know how Lieut. Hinton can teach me Aviation. Send a copy of "How to Fly" without obligating me in any way.

Name ....

Address ....

City .... *State* ....

DRI-O-LAC
AIRCRAFT FINISH

Can be used over dope. Gives an elastic finish that will not crack from vibration or bending.

Will not turn white from salt water or alcohol. It is impervious to grease and oil.

May be washed easily. Aircraft finished with DRI-O-LAC have a permanently beautiful finish.

Can be easily brushed on or sprayed. It does not sag or run. One coat is sufficient.

Sets dust-free in 2 hours and dries hard with a high luster in 8 to 10 hours.

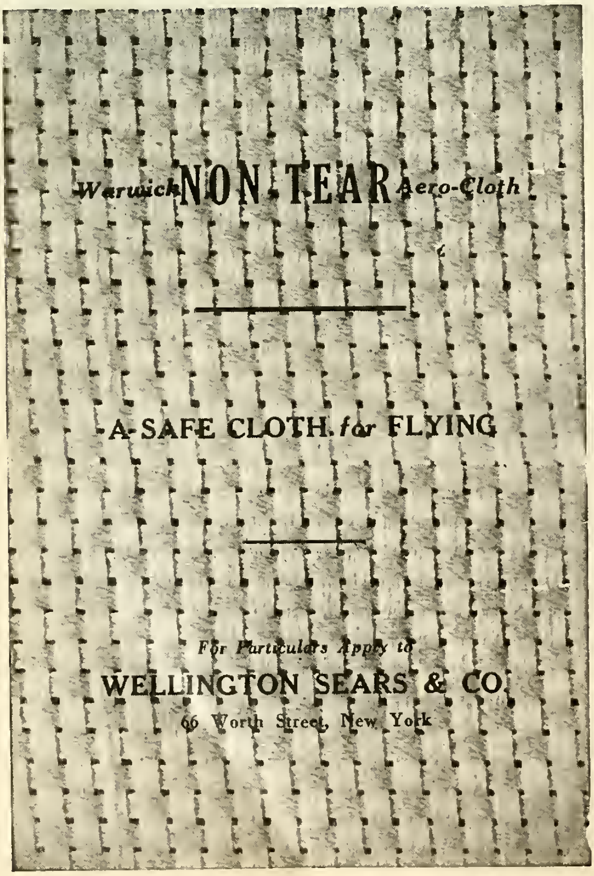
An ideal wood preservative. It also prevents rust and discoloration of metal parts.

SAVES WEIGHT—A smaller quantity of DRI-O-LAC is required to provide a lustrous protective coating than any other finish.

DRI-O-LAC meets all requirements

Write for a sample and test it in your own way

CLARK FOSDICK
28 Third Street Long Island City, N. Y.



Warwick NON-TEAR Aero-Cloth

A SAFE CLOTH for FLYING

For Particulars Apply to
WELLINGTON SEARS & CO.
66 Worth Street, New York

A NOD AND A WINK

(Continued from page 97)

supplied by the Department. The procuring of this license is not obligatory, except in interstate carrying, but it is probable that all commercial pilots will desire the official license of the Department as a guarantee of their piloting qualities to their passengers.

The point I make is this: that the unlicensed or semi-licensed pilot of the unlicensed airplane may be as safe as Casey Jones is to fly with. But how are you to know that if you are one of the public not familiar with pilots and airplanes? How are you to know that you are not flying with some kid who has done five hours and got himself a Jennie? How do you know that he and his plane are all right? If he gets his plane and himself licensed and can show you the license you may rest assured that the combination is safe for you to trust. You know, I've only got six of you readers, and I don't want to lose any of you. They pay me little enough for writing for you six, and if you delete any of yourselves the editor may cut down my rate and pay me what this stuff is really worth. How would I live then? I'm just on the ragged edge now. So stay by me, fellas.

But getting back to that pretty lady in Indianapolis, I don't see that she needs a pilot's license, either the Department's or the comic N A A one. The boys will all ride with her anyhow.

PACIFISTS will derive much comfort from the gnus that Congress refused to grant appropriations necessary to give their full complement of airplanes to the new airplane carriers, *Lexington* and *Saratoga*. For a time there was some worry that the carriers would make the U. S. Navy equal in strength to that of Checko-Sapolio, but softer counsel prevailed, and it is to be kept on the same aeronautical level as the navy of Lapland.

The Department of Defense By Prayer is hard at work on a series of prayers to be used in case we are attacked by an enemy. It is thought that this old business of God being on the side that has the most armament is now passé, and that at last He will enter the lists and defend the weaker nation, although the plan does not seem to have worked very well in the case of Nicaragua.

The idea of building airplane carriers and not putting any airplanes on them is a new wrinkle, which, it is hoped, will work out well. Battleships without guns on them would be a new departure, and one that probably wouldn't make a battleship any less valuable than it is with guns. If ideas like these spread we will see railroad dining-cars without any food in them, which will be fine things for people on a diet.

AT a meeting of the American Association for the Advancement of Science, in Philadelphia, Dr. Hrdlicka told his audience how two learned scientists mistook an elephant's knee-bone for the skull of a primitive human being, and made the announcement that they had found a second skull of the Java ape man, or Pithecanthropus Erectus. And it wasn't Pithe at all. It was this old elephant's knee-bone.

Well, that's nothing. I went in for archaeology myself a few years ago, and gave it up because I couldn't always classify my discoveries without making errors. For instance, I dug up what I was convinced was the skull of an early Congressman of the post-Volstead period and the Hypocrisy Age. And it wasn't the skull of an early or even a late Congressman, though it looked to be solid bone. It was a block of petrified wood, that's what it was. Things like that simply drive a young scientist into bootlegging.

MY old pal, Secretary of the Navy Wilbur, refused to disclose to the Fall-Doheny white-washing experts what secret information of a war scare came to the Navy before it approved the Hawaii oil storage project. That's why he's called the SECRET-ary of the Navy. And he isn't saying a word about airplanes in the Philippines where they will be worth their weight in gold one of these days. The good old Secret-ary is very hush-hush. Besides, the taxpayer isn't supposed to know anything except how to pay taxes. His not to reason why, his but to join the navy and see the world if a war starts. That's the attitude toward poor old Pro Bono Taxpayo. They'll start telling a taxpayer secrets about the same date that a Secretary of the Navy goes and fights in a war.

And say, when the day comes that kings and dictators and secretaries and diplomats and politicians and war profiteers take their places in the front trench and fight each other for these national ideals they're so fond of prating about, then will come the day, brother, when all war will cease before it begins, when the call of the dove of Peace rises above the scream of the bird of Prey, and when the lion and the lamb lie down beside each other—without the lion getting outside of the lamb. And when that day comes, fellow-sufferer, you and I are going to be far away from here, learning Yiddish so we can talk to the other angels up in the Hebrew Heaven.

THE foreign gnus informs us that Herbert Franzl, young German aviator, was arrested in Paris on a charge of stealing documents concerning the French air service. He is suspected of being a spy, and is said to have spent several years in this country searching for the American air force. But he couldn't find it. It was hiding somewhere behind the promotion list. He was deported for cabling to Germany for a powerful microscope to aid him in his search.

What first raised the suspicion of our Secret Service was that he was heard to say that airplanes would be the deciding factor in the next war. The General Staff said at once that this was Bolshevism, as they were of the opinion that the next war, if any, would be fought with bows and arrows from mule-back. Besides, they said, it was time enough to think of airplanes after the next war started, and, what was still time enough, after it had ended, as we did in the last war.

A TERRIBLE disaster has overtaken the American Army. The Army isn't very hard to overtake, so this disaster caught up without half hurrying. Several war-built huts on Governor's Island, New York Harbor, caught on fire, and as they were full of very dry army records they burnt rapidly.

The sad part of the affair is that none of the General Staff was asleep in them at the time. They were all dozing in Washington. If we could have just singed the uniforms off some of those old obstructionists and retired them to the pension list and replaced them with some of the newer boys with modern ideas we might get some place with this air business. But I guess we've got to wait for senile decay to get in its work.

•A really distressing thing about that fire was that it burnt up all the books of tactics on Indian fighting, including a plan of defense of New Amsterdam against an attack by the Indians. The Generals had it all outlined how the Dutch were to carry on in case the hostile Indians scaled Wall Street and advanced on the Aquarium. They hadn't taken into account the fact that the English had driven out the Dutch, that the Irish had driven out the English, and

(Continued on next page)

S. S. White Tachometer Drive Shafts

OUR tachometer shafts have been subjected to the severest tests and have always met every task demanded of them. Built to U. S. Government specifications, of correct design, unsurpassed workmanship and the finest materials obtainable.

We supply them to the U. S. Army and Navy.

The S. S. White Dental Mfg. Co. for many years has manufactured superior flexible steel wire shafts for every industrial purpose.

All lengths carried in stock.
Samples furnished to responsible manufacturers

The S.S. White Dental Mfg. Co.
Industrial Division
152 West 42nd Street, New York, N. Y.

SSW

AIRCRAFT ENGINES
SPARE PARTS AND AIRPLANES

Brand new or re-conditioned

One of the largest stocks of guaranteed aircraft engines and supplies. Backed by the guarantee of one of the most experienced organizations. Suppliers to foreign nations.

ENGINES IN STOCK:

LIBERTY 400 h.p.
HISPANO-SUIZA 180, 220 and 300 h.p.
LE RHONE 80, 120, and 180 h.p.
RENAULT 450/480, 300 h.p.
MERCEDES 100, 120, 160 and 260 h.p.
BENZ 220 h.p.
FIAT A. 12bis 300 h.p.
LORRAINE 100, 300 and 375 h.p.
etc., etc.

Delivery of brand new spare parts guaranteed for 5 years.

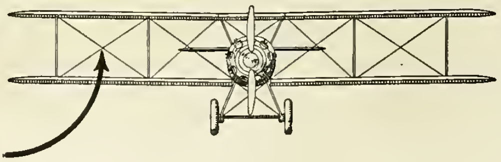
RECONDITIONED AIRPLANES

converted for
—Air Transport and Air Mail—

CAUDRON C 34 equipped with HISPANO 180 h.p. engine
FOKKER equipped with MERCEDES 160 h.p. engine
BREGUET A 14 equipped with RENAULT 300 h.p. or LIBERTY 400 h.p. engine

AVIATION MICHEL
STRASBOURG (Arsenal) France

Phones: 62.18 — 56.11
Cables: AVIAMICHEL
(A.B.C. Code 5th and 6th Edition)



Equal to the severest demands

EXACTING tests have proved that Hartshorn Streamline Wire Tie Rods are in every way equal to the severe demands put upon them. And the fact that these rods present much less surface to the wind than cable is an advantage too great to be ignored. Made according to U. S. Army and Navy specifications. Write for Circular A-1 describing these wires and end-fittings.

Hartshorn EST. 1860
Streamline Tie Rods

STEWART HARTSHORN CO., 250 Fifth Ave., New York

ANZANI AIRPLANE ENGINES
are
THE WORLD'S *FIRST* AND THE WORLD'S *FINEST* RADIAL AIRCOOLED ENGINES

Anzani engines drove the Bleriot across the Channel in 1908 and are today driving the majority of the world's new sport planes.

1927 MODELS
3 to 10 cylinders. 25 to 110 h.p.

Why experiment with untried rapid production engines? These tried hand-made engines cost no more.

New wartime engines and parts, re-inspected and re-tested; shipped direct from France:
ANZANI, RENAULT, HISPANO, LIBERTY, BENZ MERCEDES, FIAT, LORRAINE-DIETRICH.

Also new Hall-Scott 4-cylinder and parts.

BROWNBACK MOTOR LABORATORIES, Inc.
NORRISTOWN, PA.

(Continued from preceding page)

that the Jews had driven out everybody else. Outside of that the Staff's plan was right up to the minute, like all their plans.

THE gnuspapers report that French Army officers are awaiting anxiously the reports on final tests of a new German gas, which is said to have the effect of putting whole armies to sleep for four hours.

We are not interested in that gas. Our Army can go to sleep without gas, and so can our Navy. And as for four hours—well, our lads have been asleep now for four years. If you want to see for yourself, go right down to Washington and visit the Snore Department, in charge of the Secretary of Snore. If you're real quiet they'll give you a cot and you can slumber away peacefully and not wake up until the next war, in time to see the civilians march off to fight.

THE New York *Sun* of January 3 prints an Associated Press report of the impending sale of Fuga Island, forty miles north of Luzon, Philippine Islands, to a Japanese firm. By their ownership of Formosa, the Japanese are already within 200 miles of the Philippines. With the purchase of Fuga Island they will be within forty miles. How much nearer will they have to get before the Army and Navy arranges for adequate air protection of the Philippines?

If we had any intelligence higher than that of an anthropoid ape ruling our national defense operations, we'd follow one of two sane courses. We would supply a strong air defense for the Philippines, which would not be against any treaty. Or we'd clear out now from what is almost certain to be a very painful and embarrassing situation one of these days. Better practice up a little jiujitsu, you boys. I think you're going to need it.

HAVE you boys been following in the gnuspapers the contributions to American humor made by the various Representatives of this great people in Congress assembled? Here's a bit from the New York *Times* of January 5 that may not have got out to my inquiring reader in Kenosha, Wisconsin, Mr. Rhenstrom:

> Representative Vinson of Georgia, ranking Democratic member of the House Naval Committee, followed with an analysis of naval building programs in the past five years.
>
> "Since the Washington conference," said Mr. Vinson, "we have built or appropriated for sixteen ships of war; the British Empire has built or appropriated for thirty-seven ships of war; Japan has built or appropriated for 116 ships of war; France has built or appropriated for eighty-eight ships of war, and Italy has built or appropriated for forty-six ships of war.
>
> "The United States scrapped 842,380 tons as a result of that conference, and since the conference we have built or appropriated for 120,909. The British Empire scrapped 447,750 tons, and since the conference she has replaced 285,795 tons, or within 161,955 tons as much as she scrapped.
>
> "Japan scrapped 354,709 tons and has built or appropriated for since the conference, 339,201 tons, or replaced within 15,508 tons of what she scrapped. France did not scrap any ships at all, but since the conference she has added 221,828 tons to her navy. Neither did Italy scrap any ships as a result of the conference, but she has added 102,207 tons to her navy."

Now, Mr. Rhenstrom, you asked me for a lot of inflamation that I didn't have time to give you. But this ought to hold you and the King of Sweden for a while. You can see from this that the idea of building a navy is merely to scrap it, not to scrap with it. This settles a question that has been in my mind for some time: why build a navy? Well, here's the answer—to scrap it. If you build it and then sink it, you are able to let out a lot more contracts at a profit to someone in favor with the administration. If you let out enough some grateful chap may even give you a Marmon sedan, or something like that. You will note that Japan has replaced nearly all that she scrapped. There's food for thought there, Mr. Rhenstrom. You and I are probably mulling that over, but I don't suppose it's causing much thought down in Washington. They haven't got hardly anything to think with, down there, which is sort of a handicap.

THE gnuspapers have been so full of naval matters that readers have been getting quite a nautical roll in their walk. We're all thinking up in the hundreds of thousands of tons of ships to be built and scrapped, either now or during the next war. We get the impression that no matter how much we build, it's all bound for the bottom of the sea anyhow, which is quite true. That's just where it is bound. If you don't believe me ask General Mitchell. He knows more about what an airplane bomb can do to a battleship than any man in this country, which is why he is retired to private life. He knows too much for the good of our Bureaucats. Fortunately for the country, the army and navy air services are full of men who think as Mitchell does, but they're keeping very quiet lest they be banished to peaceful pursuits.

All this tonnage talk does not fool those fellows. They know that the heavier a navy is the faster it will sink. Give those lads enough airplanes and bombs, and the more an enemy's navy weighs, the better they will like it. The only kind of a navy they couldn't sink would be one made of cork.

Say, do you know the latest move of our naval strategists? They're arming the New York ferry boats so that in case of war they can repel a foreign invasion from Brooklyn.

WE MUST ORGANIZE NOW!

(Continued from page 87)

country of development. It has shown the world what it can do in all lines of human progress except in matters of defense and in the development of air power. Our conceptions of the use of aircraft are second to none in the world but we entirely lack a vehicle of expression for these such as the European and Asiatic powers have in their Department of Aeronautics unaffiliated with either Army or Navy but developed as a single agency for furthering aviation.

All patriotic citizens should join this organization with the view of learning the facts as they are and to influence their representatives in Congress to bring about suitable legislation for changing the present deplorable conditions. The Army and Navy are merely agencies of the people to carry out their will; they are not placed there for the purpose of dictating to the people what they should do.

Now is the time to act!

Transportation is the essence of civilization. We have the greatest ability in the world to develop air transportation and we shall gain more by it proportionately than any other nation.

Now is the time to place America's national defense where it should be in present world evolution!

LEARN to FLY

You Fly by Flying.

THE SWEENEY SYSTEM *of Practical Airplane Mechanics*

The Sweeney System first prepares a student by intensive practical work on motors, building, recovering wings, rigging and all details of construction, repairing and handling. This is called ground school work. To show you the quality of the men who teach you, look at Spencer and Wimer for instance. Spencer was an army pilot and has been teaching and doing commercial flying since 1917. Wimer is a college man, went overseas, was with the 1st Air Park as an observer, spent over 200 hours in the air and since the war has been with two big aircraft corporations.

Learn to Fly!

Aviation is no longer a mystery—no longer a hazard; no, it is a business, growing greater and more important; you can qualify as a mechanic, engineer, repair man, builder or a pilot.

opens up a world of opportunities for young men. The Sweeney System has no planes to sell, and sticks strictly to teaching both ground work and pilotage. Sweeney Airport is one of the best and safest fields in the U. S. All the resources of this Million Dollar School insure you the best, most practical instruction. Mechanics earn $50 to $150 a week. Flyers, up to $500.

The Sweeney System

is divided into two parts. **First:** You are thoroughly taught in the ground school. This fits you as an aviation mechanic. You can build your own plans and do anything required in aviation mechanics and construction and repairing when you have finished this work. You are thoroughly taught motors, etc., and work with thousands of dollars worth of new material, and all types of engines.

Secondly: After completing this work if you want to be a pilot you take ten hours of flying. Now when you understand that two to seven hours is all the average man needs to learn expert flying you will appreciate what ten hours in the air under skilled men will do for you.

On the ground 5 men are needed for one in the air, but if you want to become a pilot you easily master the work and can go into postal, government, or commercial work. Flyers are in demand, earning big money at fairs taking up passengers, etc. $5 for a 10 minute flight is pretty fine pay!

Send Name Today

for full details of this aviation mechanical course and photographs of planes and equipment actually used; also full information as to the commercial end of flying and opportunities for young men.

LEARN TO FLY BY FLYING

Sweeney

SCHOOL of AVIATION

3405 SWEENEY BLDG, KANSAS CITY, MO.

AN OPEN LETTER TO

MR. HENRY FORD, COL. PAUL HENDERSON, GEN. O'RYAN and other Airways Operators:

WHICH organization will be the first to instil confidence in prospective air passengers by the appointment of the first commercial Flight Surgeon for constant supervision of pilots? Of course all will at some time have their own Surgeons just as the railroads do. But a very different type of training is called for in the air program, and trained Flight Surgeons are rarer than ships that will not spin.

Who will enjoy the distinction of being first in this foresight?

A Flight Surgeon's services are offered for your consideration—the man in question is sufficiently interested in aviation to have earned the grade of Captain, Reserve, as a Flight Surgeon in the Army, and to have taken a civilian course in practical flying, receiving an F.A.I. Pilot's Certificate. Is now ready to abandon the practice of medicine and devote his time exclusively to the program of commercial aviation, as Flight Surgeon, in any capacity for which he is fitted and which offers a reasonable recompense.

If there is no opening at this time where use of his services as Flight Surgeon can be made, is willing to connect in some other capacity, utilizing the balance of his time in some such work as safety devices, passenger traffic, publicity, or new contacts. Has not failed in the medical profession but a very real enthusiasm for the air convinces him he would be happier and more useful in this activity.

He is active, ambitious, resourceful, reasonably intelligent, quick to learn, and willing to give the best he has to the game that he envisions as far bigger, even, than the profession in which he is trained. Can furnish references of any sort and is available within 30 days. Address: "Flight Surgeon," care of Aero Digest, 220 W. 42nd St., New York, N. Y.

SUPER RHONE
Fixed Radial
Air-Cooled Aircraft Engine
120 HORSEPOWER at 1400 REVOLUTIONS
We offer the commercial aviation field this new engine at a popular price.
Low maintenance cost. Surpasses all others in ease of operation, installation, service and repair.
Super Rhone Engine & Flying Corp.
Exclusive Sales Agents
P. O. Box 153 Houston, Texas.

Announcing the —
DWIGHT MONOPLANE
THREE PASSENGER
Three Models—"Tourister"—(open)
"Country Club"—(semi-cabin)
"Coupe"—(enclosed)
Up to date in most features—ahead in many.
Cheaper than an OX5 job at 200 hours.
HUNTINGTON AIRCRAFT SYNDICATE
Detroit, Michigan.

FLYING AT CLOVER FIELD

(Continued from page 89)

ing new year's greeting: There is a little minor thing you haven't given any thought to after. You felt so safe after knowing that we had the six planes and we had the men. I bet you couldn't think of what it was in a year's guesses. It's the oil. The Government lays out so much oil for each area for these reserve officers' training, regardless of the number of men there. In one area there is only 9 men, yet they give them just as much oil as they give these 600. It looks like they are kinder sore at this area cause so many of them got back alive. So there is only oil enough to operate for one-third of the time, even if they only fly one-third of the time. So the month when it comes your time to fly your seven minutes, why you get out there and you will find everybody waiting till they get in a tank load of gas from Washington. So the gas shortage cuts your flying time down to 2¾ minutes per month.

So you are not getting very far on your $25,000 that you invested in the man when you originally started into the aviation business. Mr. Coolidge, on account of his economy plan, has suggested that they fly as high as they can on what little gas they have and then coast down. In that way they get twice the amount of distance out of the same amount of gas. Now, of course, this old "economy" is a good slogan. It's a great horse to ride. But look out you don't ride it in the wrong direction. If something happens to us right now and it comes to a showdown, the shape we are in with our Army, Navy, and aviation, there would be such a howl Coolidge would have a tough time not being impeached.

Never mind appropriating all this money for river and harbor bills to get the rivers to meet the oceans. Say, the rivers will meet the oceans without any appropriations from Congress; the Almighty saw to that. If you got anything to sell, throw it on a flat boat and start it down the river; it will get to the sea without any locks and channels. We don't want boats coming up the river. Raise what you want up there, so you won't have to ship anything up. We better start doing something about our defense. We are not going to be lucky enough to fight Nicaragua forever. Build all we can and then take care of nothing but our own business, and we will never have to use it. Tunney hasn't been insulted since September.

If you think preparedness don't give you prestige, look at Japan. We are afraid to look at them cross-eyed now for fear we will hurt their "honor." Before they got a navy neither them nor us knew they had any honor. It ain't your honor that is respected among nations, it's your strength. Japan or England either would have just as much honor without any navy at all. But the navy helps to remind you of it.

Holland, Belgium, Switzerland, and half a dozen other countries got just as much honor as England, France, or Japan, but you don't see them with a permanent seat on the League of Nations. The difference is the navy. All we got to go by is history, and history don't record that "economy" ever won a war. So I believe I would save my money somewhere else, even if I had to work a little shorterhanded around the Capitol there.

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HELL'S BELLS" O'NEIL

(Continued from page 91)

"It is now time for the speeches.

"Cy Caldwell's armadillo will come to the banquet. The three men from Old Tronus Squadron will date it up. The flute player will strike up the Star Spangled Banner and the jury will bring in a verdict of accidental death. Someone will shriek, 'Just let me hit him *once!*' And the toastmaster will swallow his gavel and cut his throat with a Biscuit Tortoni.

"Under Care of the Feet—a few brief words. It is well to leave in three's, arm in arm and to stay arm in arm until you feel the solidity of the patrol wagon seat under you. It is not very comfortable riding, but if you give the driver your Croix de Guerre, he will take the softer streets and go slowly. Upon arrival it is sufficient to ask the desk sergeant who he thinks he is and what the hell he thinks he ever did in the Great War anyway.

"Dawn now comes to the little village of Lac la Boeuf and all is quiet save for the soft padding of the undertaker's men as they romp to and fro preparing the bodies for identification and burial.

"All is quiet save for the startled sleepy call of little children awakening and calling softly 'Where is daddy?'

"All is quiet save for the distant footfalls of three men from Old Tronus Squadron and the armadillo who have started off for the North Pole to get famous. (Shoes by Mac Afee).

"All is quiet save for the thin whistling shriek of a steel engraving of Napoleon which has been hurled from the window of room 2222 by the Man Who Won the War. It lands with a shattering crash in the middle of the street and the M. W. W. T. W. leans from the window with a sneer. 'You piker!' he says.

"And it is now time for speeches.

"Well," says "Hell's Bells", "I'll tell you another one—" *(In March)*.

OPERATIONS OF HAMBURG AIR HARBOR

(Continued from page 93)

This in a broad way shows the organization of the commercial field and the maintenance work. These are the commercial officials and their staffs, and the officials of the operating companies. Each operating company has its own agent on the ground to care for the business and the planes of his company.

The state officials on the field may be divided into five general groups: mail, police, custom, wireless and meteorological survey.

The air mail has its special receiving and dispatching offices in "Halle A." It maintains a force sending out and receiving the mail from the planes, and speedy motorcycle mail carriers who make frequent trips to and from the city post offices.

The air force of the police department has control of the grounds, issues permits for all starts, receives the permits for all landings, and examines the certificates of the pilots. It maintains order through the harbor, but as yet has no way of controlling the air, since the stipulations of the Ambassadors' Treaty and the general depletion of the State treasury has made it impossible for them to purchase the necessary small fast planes.

The customs officials inspect freight and passenger baggage, passports and tickets, and collect custom duties upon incoming goods.

The wireless apparatus and personnel are a part of the Reich Telegraph system, keeping in touch with all of the air harbors in Europe, announcing the start of planes from other fields to Hamburg and the departure of planes from Hamburg to other fields. It communicates with air pilots along their routes through the radio department, gives them accurate information on weather conditions and possible changes, and keeps them informed as to their position.

The Meteorological Survey, in coöperation with the radio and wireless, receives and sends out hourly reports on weather conditions in all parts of Europe. Before leaving Hamburg, pilots are required to report at the office of the Weather Bureau, where they are given a small slip with the weather conditions along their route, and possible changes which might occur before they land. This is a powerful aid to safety in the air, and has done much to establish safe flying. It will also become a most important factor in our American system, once we fly regularly with passengers, freight and mail from coast to coast.

ADVERTISING

Probably the biggest factor in the tremendous up-swing in German commercial aviation is the well-organized system of advertising which keeps aviation constantly before the eyes of the people. Advertising was launched when the first plane raised its wings above the surface of the ground after the signing of the armistice. And the point which this advertising has hammered away at is *safety*. German commercial aviation had the same struggle on its hands that we in America have today—overcoming the fear and prejudice of the people against air travel caused largely by the deaths of careless "stunt" flyers.

Not only in their advertising, but in their service, the Germans have built up a reputation for safety. During 1925 not a single passenger of the 87,000 using the air lines lost his life. The insurance companies willingly insure the lives of air passengers for somewhat over $6,000, at the same rate of premium they extend to railroads. Quite an achievement! A passenger on purchasing his ticket automatically insures himself when he signs it, since the policy is guaranteed on the rear of his ticket.

STUDY AT HOME

By the EXPERIENCE METHOD

Amazing new developments in aviation calling for the expenditure of millions of dollars, opens up vast opportunities for trained men.

Success in aviation depends on a thorough understanding of the fundamental principles of aviation, and are thoroughly taught in our course of Applied Airplane Engineering.

Get into aviation while it is still in its infancy. Success, fortunes, and popularity await those who qualify now.

A Lifetime of prosperity can be yours!

The 1927 King Bird

STOP WASTING TIME

Your opportunity is here, NOW!

WRITE FOR FREE CATALOG AND FULL PARTICULARS

Aeronautical Training Division

Under the direction of practical airplane men

WESTERN AIRPLANE CORPORATION

Dept. 272 53 West Jackson Boulevard, Chicago, Ill.

Builders of the King Bird

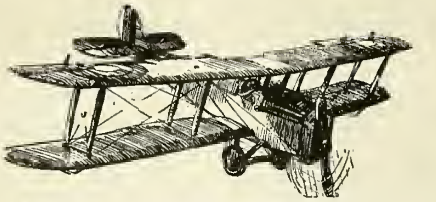
Special editions of transportation newspapers are issued at regular intervals—usually weekly—announcing to the public the air schedules, the rates, and pointing out the conveniences of air travel. Pamphlets and special letters are sent to business houses, giving transportation rates on freight, and showing the business men the time and money saved by taking the air route.

Time tables are carefully worked out, and tastefully arranged. They are distributed to travel bureaus, station agents, large hotels and business houses.

Probably the most spectacular means of keeping the air-lines before the traveling public are the huge posters of daring design which are to be seen in the centers of the big cities. They make a strong appeal to the passers-by. Shop windows display beautiful air views of the cities, the open country, the mountains, and show the interiors of the luxurious limousines of the sky. Air travel tickets are to be had at practically all first-class travel bureaus, at steamship agencies and on the large transatlantic liners.

Free public exhibitions are held from time to time.

What a lot of useless experimentation and loss of time might be avoided if a few people, conversant with European conditions, might spend a season in the various great air terminals of Europe, making a systematic study of the material equipment, personnel organization and other methods of carrying on the work to interest the public. Not that such students of commercial aviation may then return to their own country and write a charming treatise upon "My Ten Thousand Miles Through the Air," or "Europe From Above the Clouds"; but that regular and accurate information of real value may be made available. It would be well worth trying this method in helping to bring the United States to a more prominent place in commercial aeronautics.



What Do You Know About Airplanes?

A FEW years ago men had to learn about aircraft from personal, costly experience. They had no one to guide them—no one to point out mistakes when they were made—and therefore years were spent learning what takes months now.

THOROUGH—PRACTICAL TRAINING

Today the American School of Aviation offers you these long years of experience and knowledge, which cost millions to acquire, in their new and fascinating Home Study Course in Practical Aeronautics which has been highly endorsed by prominent aviation authorities.

WRITE TODAY

No matter whether you have worked with airplanes all your life or are just beginning in the industry you owe it to yourself to send for a complete and detailed outline of this training and our new and interesting free book, "Opportunities in the Airplane Industry."

American School of Aviation

Dept. 2781, 3601 Michigan Ave., CHICAGO, ILL.

U. S. AIR ROUTE OPERATORS' REPORTS

(Continued from page 94)

They have ordered a number of modern sixteen passenger airliners. The first big Fokker delivered to them was christened the "Chicago," the name of which would indicate that they are looking west in their plans for expansion.

C. A. M. No. 2, Chicago-St. Louis (278 miles)

Operated by Robertson Aircraft Corporation

SINCE its inauguration on April 15, 1926, the Chicago-St. Louis air line has made 392 single trips, totaling approximately 108,976 miles with a record of about 95 per cent performance. The efficiency percentage is based on "arrival at destination in time for connections," which the Robertson Corporation believes to be a most important requirement. Figuring the efficiency record on basis of elapsed time against schedule time their performances reach a still higher percentage; their records show 99.16 per cent in the month of November.

Although the Robertson organization is not large all its members have long experience in the aviation business. The company is incorporated for $500,000, half paid in and all of the stock, with the exception of a few shares, is owned by the two Robertson brothers.

During the operation of the air line, the following checks have been received from the Post Office for mail carried: April (15th to 30th), $3,023.89; May, $2,324.93; June, $2,705.86; July, $6,968.69; August, $8,536.06; September, $7,574.92; October, $7,178.78; November, $5,250.29; December, $6,894.81.

It will be noted that there is a gradual increase up to and including August when the bad weather set in on the transcontinental route which seriously effected tonnage. The company's solicitors report that their patrons advise they will start using air mail again whenever they are assured that they will have service. The heavy fog, which cannot be flown through safely, is the only thing to blame for this. However, the fog season is over now, and a gradual increase in business is expected. A big jump in tonnage is anticipated beginning February 1, when the new flat rate of 10c per half ounce goes into effect.

Robertson is not making money on the air mail, but is about breaking even. If they did not operate it in conjunction with other commercial aviation activities their overhead would of course be much higher.

Thirteen additional air mail planes were recently purchased from the Post Office Department, which with their original four make seventeen ships. They have taken four of these ships out of service, leaving thirteen ships now in service. These mail planes are reconstructed and overhauled before they are used. This fleet of airplanes, motors and parts puts the Robertson company on a very solid economic basis.

C.A.M. No. 3, Chicago-Dallas (987 *miles*)

Operated by National Air Transport, Inc.

SINCE figures are compiled by N A T semi-annually, and since it has been operating only since May 12 last, it is possible to give figures on performance only for the initial six months of operation. During that time N A T has flown its route, nearly a thousand miles, each way seven days a week, through stormy weather and fair, and completed its flight on scheduled time 92 per cent of the time. Its pilots have flown in the period named 341,000 miles of scheduled flying in addition to 33,000 miles flown in ferrying and testing.

On scheduled trips only four forced landings have been experienced as a result of mechanical difficulties, an approximate average of one to each 85,000 miles flown. Of thousands of pounds of mail carried, totaling an estimated 2,000,000 letters, not one has been damaged or lost. No one has been injured, and repairs due to accident have aggregated less than $1,000 in cost.

A closer analysis of figures for the first 346,346 miles scheduled shows there was flown actually 343,709 miles, revealing a performance of 99.24 per cent efficiency. The route of the N A T is operated in two divisions, north and south from Kansas City. The northern division, Kansas City to Chicago, is 460 air miles. The southern division, Kansas City to Dallas is 540 air miles. In both directions mail changes airplanes at Kansas City, making each pilot's flight approximately 500 miles in length. The company's reports indicate an average efficiency northward of 95.6 per cent, and southward of 90.3 per cent.

National Air Transport maintains a fleet of ten mail planes, Curtiss Carrier Pigeons with Liberty engines. Four planes are in actual service, six in reserve, some for emergency, some for change-off to allow for complete inspection and overhaul. The general airplane repair shops are located at Richards Field, Kansas City, in an all-steel building 75 by 100 feet. Engine repair shops are located at St. Joseph, Mo. To reduce delays to a minimum, at each of the eight stops along the line are kept airplane parts including a complete engine ready for emergency installation.

Col. Paul Henderson, general manager of N A T, reports as the greatest constructive accomplishment of the year 1926 the closing of a contract by his concern with the American Railway Express Company to fly package freight over the present contract air mail route between Chicago and Dallas and to extend that line from Chicago to New York for express purposes. Service will begin April 15.

C.A.M. No. 4, Salt Lake City-Los Angeles (600 miles)

Operated by Western Air Express, Inc.

WESTERN AIR EXPRESS, INC. has earned its way from the first flight last April 17. Since that time its fleet of Douglas mail-passenger planes have flown an aggregate of more than 330,000 miles without mechanical mishap of other than a minor nature. No mail entrusted to this company for transport has been damaged or lost and on only two occasions has this company, its equipment or personnel been responsible for any delay in dispatch of air mail.

The 600-mile airway over which it flies traverses a region of mountains, desert and plateaus. It is a rugged course over the waste lands along a route which the fastest train requires 25 hours—the airplane less than 7.

Five weeks after its inaugural flight, Western Air Express, Inc. opened its line to passenger service. This service proved more popular than had been expected from the experimental nature in which it was conceived, and passenger accommodations in the mail planes are being continued through the winter months. During the summer and early fall, an average of better than one passenger daily was flown the 600-mile course. Winter has caused a falling off in demand but in December 10 passengers were flown and January promises to exceed that number.

In air mail production, Western Air Express, Inc. has equalled its mechanical performance record. When the line opened, average air mail volume to and from Southern California did not exceed 40 pounds daily. During the first month of this direct service connecting at Salt Lake City with the transcontinental line, the daily average was 220 pounds and in December the poundage reached a daily average of 370. The growth has been steady, each month showing an increase over the thirty days immediately preceding.

A principal factor in this growth—which found Western Air Express, Inc. in December carrying approximately one-fourth of all the air mail in America—has been the fact that this company has sold its service on a strictly business basis without recourse to any appeal of a patriotic or sectional nature.

"If the Air Mail will pay you, it's good business to use it," has been the sales talk of its agents, and they have worked out with individual mailers innumerable uses, special applications, of air mail to business. As a result, the effort has been cumulative and the volume has gone steadily forward.

Indications are that present growth will continue. Preparations are being made to care for an anticipated heavy passenger demand next spring, and air mail volume is being put on every day. From an adventure in patriotism, Western Air Express, Inc. has been brought to a definitely profitable, prosperous business during its first year.

C. A. M. No. 5, Elko-Pasco (435 miles)

Operated by Walter T. Varney

OCTOBER 21st completed the first full month's operation of the Varney air mail service. This route is one of the most difficult mail routes in the country, yet they have flown 1,463 hours in their "Swallow" mail planes, with an approximate total mileage of 146,000 miles.

C. A. M. No. 6, Cleveland-Detroit (91 miles)
C. A. M. No. 7, Chicago-Detroit (237 miles)

Operated by the Ford Motor Company.

Operation reports on these routes have not been made available.

PLANE BUY WORDS—

TRADE HAMILTON MARK

PROPELLERS

HAMILTON AERO MANUFACTURING CO.
50 Keefe Avenue, Milwaukee, Wisconsin

The most complete stock of
AIRCRAFT STEELS
to Government specifications
in America

Alloys and Simples
All standard numbers in stock

BARS (hot and cold rolled) STRIPS

THE DICKERSON STEEL COMPANY
DEPARTMENT 1
DAYTON, OHIO

C. A. M. No. 8, Seattle-Los Angeles (1121 miles)

Operated by Pacific Air Transport, Inc.

PACIFIC AIR TRANSPORT, since its inauguration on September 15, 1926, to December 31, 1926, has flown upwards of 250,000 miles carrying 19,658 pounds of mail.

Up to November 20, 1926, their service was 98 per cent perfect. Since that time, delays have occurred and two of their planes have met with serious accident. These delays and accidents resulted almost entirely through the impossibility to secure adequate knowledge of weather conditions. These obstacles now are being overcome through the receipt of accurate weather reports, and through the installation of a system of radio communication. With the experience of the worst season of the year behind them, a season that has been almost unprecedented for its number of days of heavy fogs, they look into the future with high hopes, having learned many things and overcome seemingly insurmountable difficulties.

Twelve planes compose the Pacific Air Transport fleet—seven Ryan M-1 monoplanes, one DH, two Travel Airs, one Swallow and one Waco.

As the time schedule required their leaving Los Angeles at midnight, and Seattle before daylight, the company lighted the airways between Los Angeles and San Francisco, and between Seattle and Portland with ten revolving beacons of 7,500,000 candle power each, and twenty intermediate beacons of 400,000 candle power each. The cost approximated $15,000. They built hangars at Los Angeles, Medford, Vancouver and Seattle and have the use of a splendid hangar and thoroughly equipped shop at Crissey Field, San Francisco, where the major overhauling is done; also the use of a large hangar and workroom at

(*Continued on next page*)

(Continued from preceding page)

Concord. Their total force, including officers, pilots, mechanics and airport employees, averages 43 persons.

They have carried 102 pay passengers in their open mail planes. During the winter months, however, passenger carrying has not been encouraged. The fare from Seattle to Los Angeles is $132.50. Intermediate stop fares are in proportion to distance.

They propose to install, at the earliest practicable date, the most modern cabin planes to care for the business that is inevitable as soon as it becomes generally known that the mail and passenger time between, for example, San Francisco and Portland is six hours via plane, as against twenty-seven hours via the fastest train.

C. A. M. No. 9, Chicago-Minneapolis (337 miles)

Operated by Northwest Airways, Inc.

STARTING October 1, the Northwest Airways, Inc., took over the Chicago-Minneapolis air mail route from Charles Dickenson. Although operating under difficult winter weather conditions, the line has broken even for the first three months' operation. Stinson cabin planes are used.

C.A.M. No. 10, Atlanta-Miami (683 miles)

Temporarily Suspended

Operated by Florida Airways Corporation

THE new year saw the completion of 283,108 miles of flight over Florida and Georgia by Florida Airways without injury to any person or serious damage to equipment, the extension of the route from Jacksonville to Atlanta, and the gaining of thousands of air-minded Southern enthusiasts who only a few months before spoke severe opposition against the "new fangled flying machine."

The books for 1927 were opened with the announcement that bids had been advertised by the government for an Atlanta-New York air line and routes from Atlanta to New Orleans and Atlanta to Chicago would be opened during the forthcoming year. Predominate among these New Year's announcements was the program for lighting the airways from Florida to Gotham, installation of these lights to be completed by July of this year.

Service over C. A. M. No. 10 was, therefore, temporarily suspended until lights were installed allowing the operators ample time to reorganize, gain night flying equipment and make ready for the inauguration of the Florida-New York service, a service that will place south Florida within 15 hours of New York City.

The Airways planes of Ford-Stout, Stinson-Detroiter, Curtiss-Lark and Travel Air types, flew 260,124 miles on schedule, or 90 per cent of the scheduled mileage. Of the total flight mileage, 22,984 miles were special flights, one of these carrying a cargo of $2,000,000 into the lower East Coast storm district—the largest cargo of money ever dispatched by plane in this country. During this period the maintenance department and traffic department lowered the cost of operation more than 50 per cent.

On June 1, sixty days after the opening of the air mail lines, Florida Airways inaugurated daily air-passenger service. During the seven months of passenger carrying 939 passengers used the planes for rapid transit, the majority of these passengers flying between Miami, Fort Myers and Tampa or between the east and west coasts. More than a 12-hour time saving was accorded over rail transportation between Miami and Tampa and more than 15 hours between Miami and Fort Myers.

Novel Free Gift for Aero Fans

We present a complete series of facsimiles of "The British Gazette" to every new annual subscriber to "The Aero Field." "The British Gazette," the only daily newspaper issued by the British Government, appeared for eight days only during the great general strike and all editions were largely distributed by aeroplanes. It is an unique souvenir, commemorating the value of aviation during an epoch-making crisis.

"The Aero Field" (85c per annum, post free) is read by aero fans in five continents and is the only illustrated journal of its kind in Europe.

FRANCIS J. FIELD, Ltd.
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10331 CHARLEVOIX AVENUE, DETROIT, MICHIGAN

NEW HISPANO MOTORS

150 h. p.	$ 525.
180 h. p.	550.
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NEW CURTISS MOTORS

90 h. p. OX5 (original cases)	$ 375.
Government rebuilt	250.
Rebuilt in our shop	180.
OXX6, run five hours	450.
OXX6, in good condition	275.

ANZANI MOTORS

Fan type, 25 h. p.	$ 200.
Y type, 35 h. p.	325.
45-50 h. p.	300.
60 h. p.	300.
90-110 h. p.	300.

OTHER MOTORS

Salmson, 230 h. p.	$325.
Falcon Rolls Royce, 264 h. p.	700.
Le Rhone, 80 h. p.	90.
25 Liberties, 420 h.p.	1,500.
35 Beardmores, 160 h. p.	250.
100 Mercedes, 260 h. p.	600.
25 Benz, 230 h. p.	675.
2 Isotta Fraschinis, 250 h. p.	1,000.
New Hall-Scott four, 100 h. p.	185.

MOTOR BOAT CONVERSIONS
on (CAPITAL) conversion

OXX6 Curtiss	$ 650.
A-7-A 4-Cylinder Hall-Scott	350.
220 Hispano	$1000.
Liberty 420 h. p.	$2200.

MISCELLANEOUS

D-81 Berling magnetos, new, $14; Berkshire magnetos for OX5, $10. Beacolite Liberty distributor heads, $4 each; Liberty cylinders, $8 each; Liberty cam shafts, new, $100. Hispano cylinder blocks, $45. Liberty Water Pumps, $15. Hand starters, $25.. Hispano pistons, model E, high compression, $8 each (new).

Write for Our Complete List of Parts

For Sale—

VIMALERT LIBERTY MOTORS

12 Cylinder 400 H. P.

Investigate our special offer for 100 to 150 motors at an extremely low price. For boats and airplane use.

The Vimalert Company, Ltd.

807 Garfield Avenue, Jersey City, New Jersey, U.S.A.

Cable Address: ROCUSE, NEW YORK, (Bentley or ABC 5th Edition)

NEW IMPROVEMENTS
Stub Tooth Gears
12-Volt Delco Jump Spark System
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Inspection Plug and Hole
New Type Plug Terminals
Mica Spark Plugs
Reenforced Corrugated Cylinder Heads
New Type Piston and Rings
Relief Valve
High Altitude Control
Woodruff Key
Complete Tool Kit

C.A.M. No. 12, Cheyenne-Pueblo (199 *miles*)

Operated by Colorado Airways, Inc.

COLORADO AIRWAYS have been in operation since May, 1926, flying about 400 miles every week at a cost per mile of about 30 cents. There have been no serious accidents or washouts during this period.

Mail is increasing steadily, the people of Pueblo, Colorado Springs and Denver being very enthusiastic over the airline.

Passenger carrying is also on the increase. Rates are $50 per round trip from Cheyenne to Pueblo and return.

C. A. M. No. 13, Philadelphia-Norfolk (278 miles)

(Temporarily suspended)

Operated by Philadelphia Rapid Transit Company

P. R. T. Air Service was organized as a contribution to the Sesquicentennial exposition, illustrating the last word in the science of modern transportation. They retired permanently from the air transport field with the close of the Sesqui on November 30. Mitten Management, however, has offered to coöperate with the plans of the Department of Commerce for air transport development, but will not begin operation before next spring.

P. R. T. Air Service, in five months operation, carried 3695 passengers safely, using Fokker tri-motored planes. 93,770 miles were flown in regular service, without even a minor mechanical failure. 1377 lbs. 6 ozs. of mail were carried. Out of a total of 688 trips scheduled, 75 were cancelled and seven were uncompleted because of adverse weather conditions.

The total operating cost from July 6 to November 30, 1926, not taking into consideration loss of capital investment, was $169,000. The total revenue was $50,600 (passenger carrying $46,200; mail and express, $4,400). The operating loss was $118,400.

Although this figure may appear unusually high, consideration must be given to the fact that this service was conceived primarily as an exhibition of modern transportation service at the Sesquicentennial. The special equipment and operation of large busses to and from the fields, the uniforms of all operating personnel and attendents, the specially designed and built passenger stations and hangars, the leasing and grading of an entire private field within 10 minutes of the center of Washington, the advertising, publicity, posters, circulars, sky-signs, passenger insurance, and other traffic selling and handling means, no doubt achieved the effect of a demonstration to the maximum extent, but the total cost went up correspondingly and cannot be used for purposes of comparison with other lines.

PASSENGER AIRLINES — NO MAIL CARRIED

Detroit-Grand Rapids Airline (140 *miles*)

Operated by the Stout Air Services, Inc.

WITH a record of 100 per cent in safety and efficiency, the Stout Air Services, Inc., on October 30th, completed the first three months of airline operation between Detroit and Grand Rapids.

The total passengers carried during the three months, were 399. Of these, 281 were pay passengers, 87 complimentary, and 31 are classed as company business.

The cost of operating, maintaining, and advertising the service exceeds the revenue from passenger fares, but this is largely due to the fact that but one ship, a Stout-Ford all metal cabin monoplane, was operated. Practically the same personnel could operate two round trips per day with only a slight increase in the general overhead expense.

METAL STREAMLINED
SKIS
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WHO IS "LOONEY" NOW?

(*Continued from page 96*)

We know that nothing should be done to curtail the Reserve flying hours so that they are one minute less than those of 1927.

The presentation of the matter of Reserve flying by Assistant Secretary of War Davison, did not show this situation in its true importance.

In the event of war the Reserve flyers, if we have any left, will be the mainstay of the nation.

So we have been progressing backwards.

Therefore, let us now, to be consistent, remove the eagle from the Shield and substitute the soft-shell crab.

Even the Navy was slashed. Their program called for approximately 300 planes and they were granted 155.

It all boils down either to conspiracy or stupidity. In effect it is definite destruction of our air development.

The situation strongly emphasizes General Patrick's repeated demand for a separate Air Budget and shows how wise was General Mitchell in asking for a Department of National Defense with a Secretary for Aviation.

ENGINEERING IN AIRCRAFT

(*Continued from page 90*)

tests with relatively low cost.

The analytical methods of calculating the performance and stability of an airplane are numerous and varied but fundamentally they are in very good agreement and the question as to which to use is merely a matter of preference and convenience.

The problem of stability is believed by engineers to be more complicated than performance estimates. With the aid of theoretical methods and tests now available it will soon be realized that there is almost as much certainty in stability calculations as there is in performance prediction, and that it is a matter of careful reference to existing data and proper judgment which have an equal importance in performance calculations. Unquestionably the slipstream and downwash effects have a much greater importance in stability calculations than in performance analyses of an airplane, and it is from known test results that one must approximate their effect.

Besides the flying performance it is possible to investigate analytically the problems of take-off and landing for landcraft and water performance for watercraft.

To illustrate how it is possible to predict closely the aerodynamical performance of a new design, I cite the example of the Vought "Corsair," a two-seater observation airplane recently developed by the Chance Vought Corporation. Analyses were purely analytical, the only test information being characteristics of isolated wings constituting the cell and engine data. The results are as follows:

Performance: Characteristics of three different propellers were found to correspond to the analytical investigation. High speed was checked within from ¼ to ½ m.p.h. for the three propellers.

The figure arrived at in the climb in 10 minutes varied within the limits of personal errors of different observers.

The best speed of climb figure reported by the test pilot was the same as in performance. General change with altitude was also the same.

The ceiling obtained was better than the one expected from the performance calculation.

The fact that the calculated sea level performance corresponded so precisely with the actual performance of the airplane indicates that the characteristics of the airplane were accurately predicted and the only discrepancy could be in the data on the altitude performance of the Pratt and Whitney "Wasp" engine which was not available at the time and was assumed to be same as for the average engine.

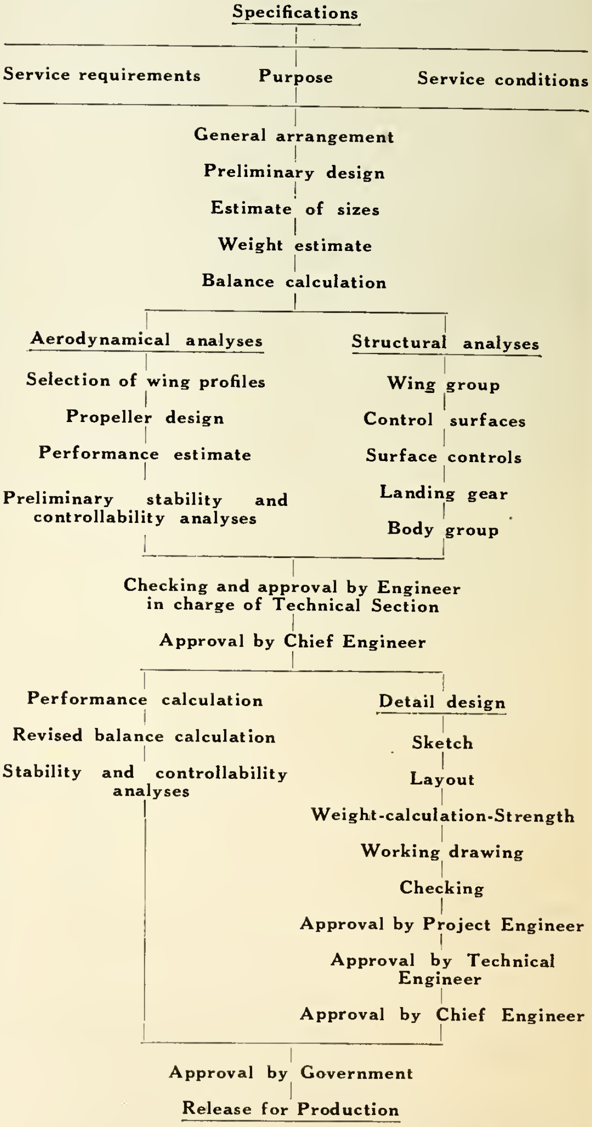
The better altitude performance of the airplane shows that with altitude the loss of power of the "Wasp" engine is not as great as of the average engine.

Minimum flying speed checked within 1 mile per hour.

Stability and controllability: Tail setting required to balance the airplane at a specified speed so as to enable the pilot to fly with loose controls, "hands off", agreed exactly with the one predicted in the analyses.

The two other points—*stick forces* (namely the effort which must be exerted by the pilot while flying at different speeds), and *angle of elevators* required to balance the machine were not verified by special tests, but from the ease of controls and observations of pilots and observer the calculations are very well confirmed.

TYPICAL SEQUENCE OF PROCEDURE IN AIRPLANE DESIGN.



(In the March issue I will deal with the structural problems of design and point out the beneficial influence of Army and Navy requirements on the standards of American aircraft engineering.)

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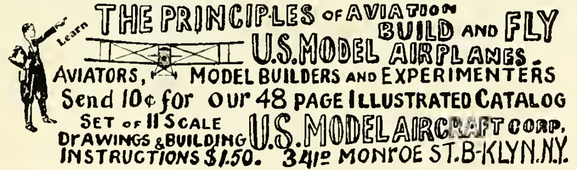

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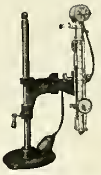

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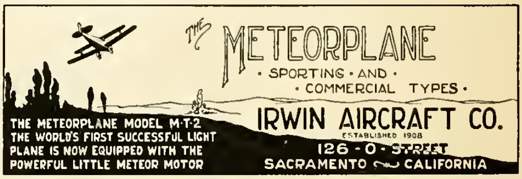

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To Pilots and Mechanics

As you noticed by my Declaration of Independence last month, I have started a registry of pilots and mechanics desiring employment, and, through the courtesy of Aero Digest, *will maintain a file of names of those anxious to leap into the air. I take this thought from J. Don Alexander, the man with a smile away out there in Denver—the Eaglerock laddie, you know. He publishes an interesting house journal once a month in which he speaks favorably of the Alexander Eaglerock and also—what is very strange—speaks kindly about his competitors. Outside of that he seems fairly normal. He's a good sort of scout and is always thinking up some scheme to further aviation—among which he hit upon the idea of running a free list of names of those wanting work—or needing it, anyhow, even if they didn't want it. I thought so well of the idea that I prevailed upon the publisher of* Aero Digest *to do likewise. He agreed at once, so if any of you boys want to get into the same business with Henry Ford, and make your fortunes—if any—write in to me giving full particulars—and don't stretch them too far.*

And you big, handsome, kindly, generous-hearted employers—if you need a pilot or mechanic, drop me a line and I'll send you a list of the experts who are simply straining at the leash, willing and eager to leap into the air or change a tire, or whatever it is you want them to do.

This service is FREE. It costs you absolutely nothing—and may turn out to be worth it.

I see by the December issue of my old contemptuary, the National Aeronautic Association Review, that they've got Alexander's idea too, and are developing it in their own comic way. That Review is a monthly publication devoted to unconscious humor. They say naively, that their service is free, but subject to the following regulations:

"1. Only applications of bona fide members of the NAA in good standing will be listed."

In other words, if you're out of a job and broke you've got to pay $5 and join their association before they'll even consider listing you for a job. If you can think up a joke to beat that one, let me have it, as I haven't had a real hearty laugh since I watched Howard Wehrle swimming about on his Swampy-centennial flying field at Philly. Personally, if you need a job I'd be glad to try to get you one, even if you belonged to the NAA. I wouldn't hold that against you. We all make mistakes. But listen to rule 2.

"2. Applications must not contain more than thirty words and must be sent to this office."

Now, I place no limit on what you want to say about yourself. Take thirty words or thirty thousand. It's all the same to me. I don't have to read them if I don't want to. And they don't have to be "sent to this office". If you're not smart enough to address the letter to the place to which you want it to go, why you're too dumb to be a pilot.

They've printed six rules in all, and they're all good. I enjoyed every one. I was able to open my mouth real wide and give my tonsils quite an airing.

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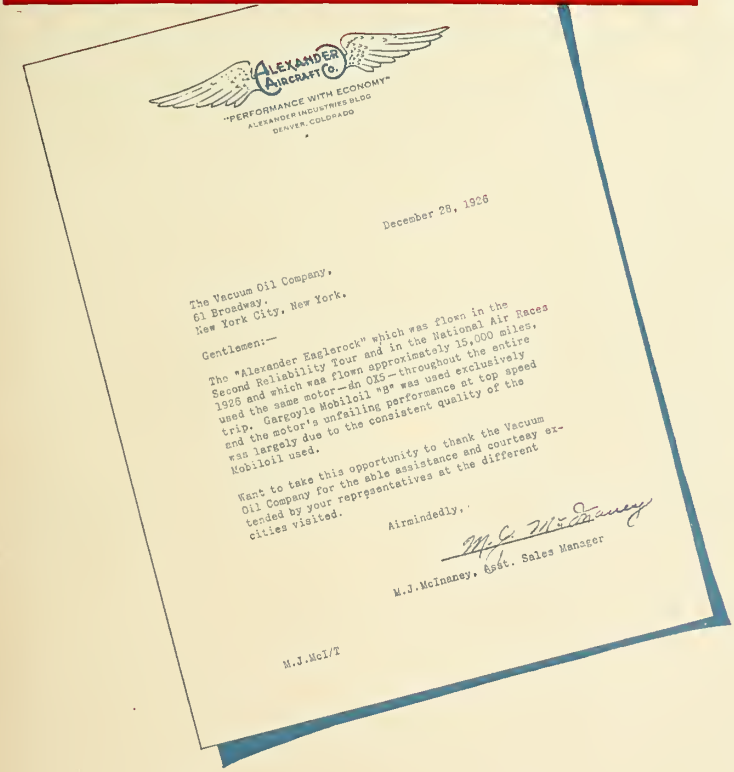

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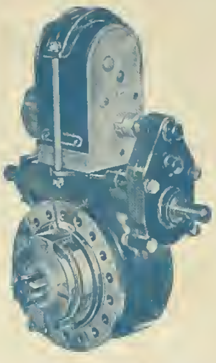

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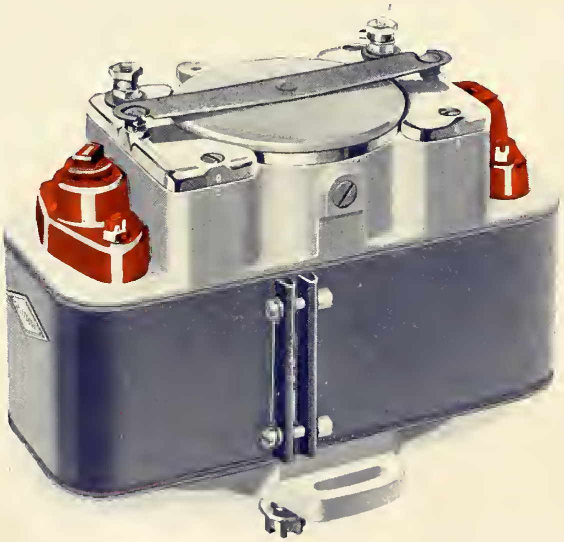

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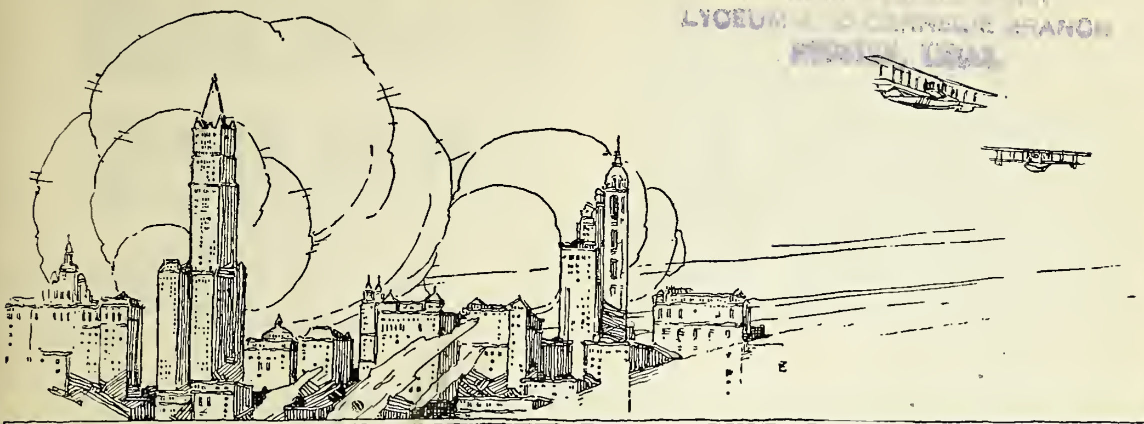

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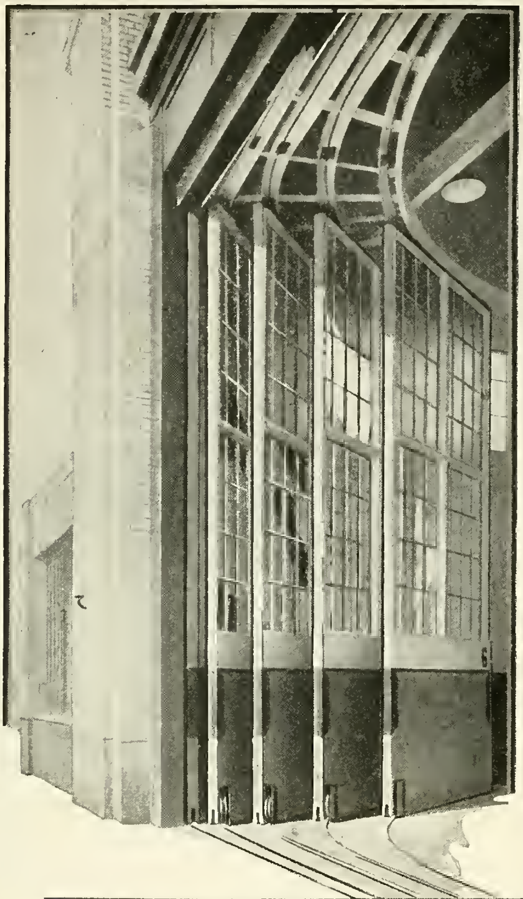

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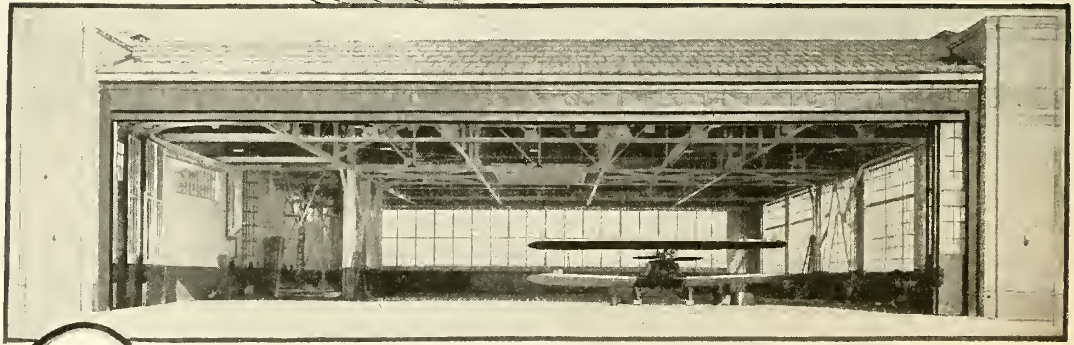

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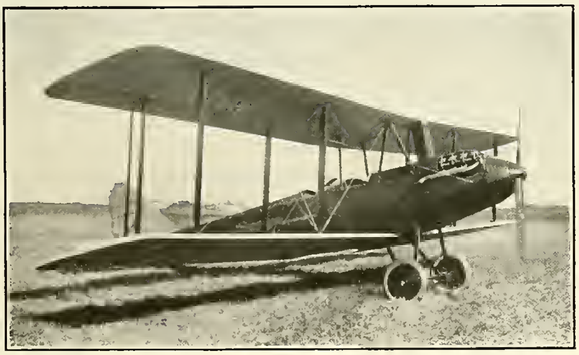

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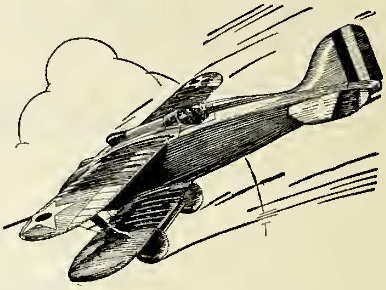

"Cy" Bettis' record-breaking Pulitzer Winner for 1925 was Valsparred, of course.

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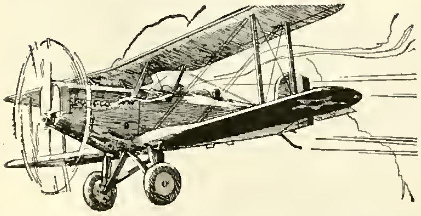

General Patrick's own plane is finished with Nitro-Valspar in Yale Blue and Aluminum.

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AERO DIGEST

THE MAGAZINE OF THE AIR

Vol. 10 No. 3 MARCH, 1927

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Phone: Wisconsin 3771. Cable Address: AERODIG.

AERO DIGEST
is published monthly by

THE AERONAUTICAL DIGEST PUBLISHING CORP., 220 West 42nd Street, New York City

Frank A. Tichenor, President.
A. Horsfall, Vice-President.
K. Healy, Secretary.

J. E. Horsfall, Editor.
George F. McLaughlin, Associate Editor.
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LOS ANGELES OFFICE: 1129 Mohawk Street. Frank Samuels, Representative. Phone: Dunkirk 6332.
PHILADELPHIA OFFICE: 1013 Commercial Trust Bldg., S. E. cor. 15th and Market Streets. Phone: Rittenhouse 3247.

Single Copy 25c. Yearly Subscription $3; Canada $3.50; Foreign $4.

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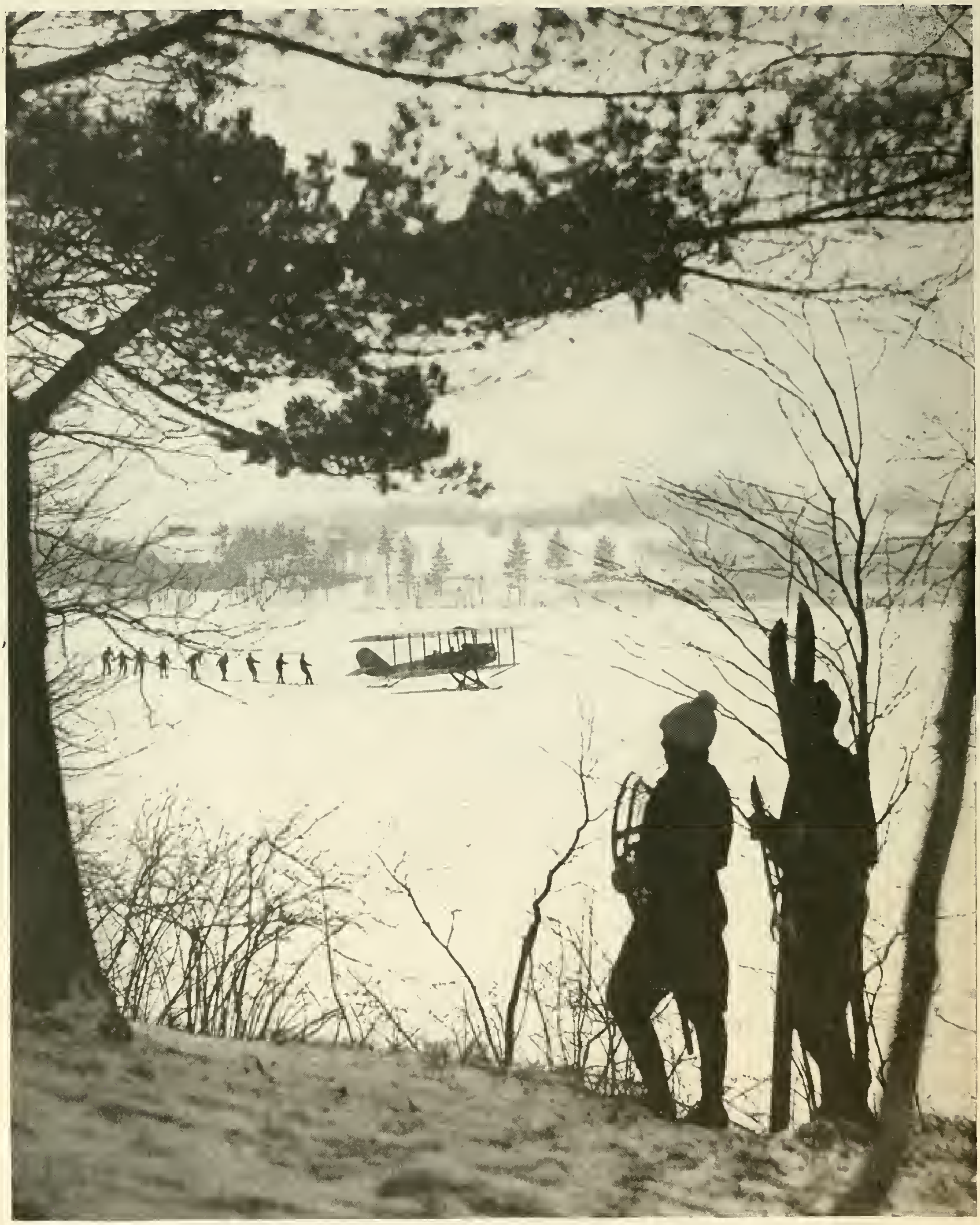
Entered as second-class matter July 17, 1922, at the Post Office at New York, N. Y., under the Act of April 3, 1879. Copyrighted, 1927, by Aeronautical Digest Publishing Corp.



P. & A. Photo.

New Fun in Jack Frost's Kingdom!

Aero ski-joring is the latest winter sport. Skiers on beautiful Mirror Lake, Lake Placid, New York, in the heart of the Adirondacks, being towed by a Standard J1 airplane.

FLIGHT TRAINING

By Lieutenant Barrett Studley, U.S.N.

This is the first of a series of articles by Lieutenant Studley on Flight Training

On December 17, 1903, occurred the first solo flight in a heavier-than-air craft. It was by no means as long or as complicated as even the brief first solo of a student today. The time was only fifty-nine seconds and no turns were made. But it inaugurated the epoch of heavier-than-air aviation and the problem of flight training.

Training in those early days was perforce characterized by the utmost simplicity. You simply went up in an airplane. You knew how it was theoretically intended to work, and therefore how it should work. But practically you were absolutely without experience. The plane, if sufficiently well designed, might be expected to take off. You then found yourself in the air. If you could fly, you did. If you couldn't, you crashed. The students had to be very courageous men.

The immense advantage of practical training prior to the first solo flight was early recognized. This led to the invention of dual controls, so that the student's beginning mistakes could be corrected by an experienced pilot before loss of control occurred. This system was adopted very early in the history of American aviation, and since then has been the basis of all flight training. It is recognized as the only safe method of learning to fly.

But dual instruction in those early days was of the most elementary nature. It was much more likely to be of two or three hours duration than of ten hours. For reliability was still a thing of the future so far as aviation was concerned. Every minute in the air involved hazard. The construction of planes of an individual rather than a standardized basis, involved an immense amount of labor, and a student's mistake might easily require weeks of repair work. Consequently dual instruction was expensive and hard to get. And on account of its brevity the subsequent first solo was still more or less of a hair-raising adventure. Only the most ardent and absorbed enthusiast ever dreamed of flight training.

Then came the war and the resultant upward surge of aviation. Military necessity required thousands of pilots. The problem of flight training immediately became an imminent and vital one. The former method of purely individual, unorganized instruction was no longer adequate. Training had to be systematized and expanded to meet the demand for large-scale production of pilots.

The first essential was suitable planes. The time-honored JN appeared, and thousands of young Americans first looked down on the ground spread beneath them from the rear cockpit of a Jenny. The N9 was built for the Navy, while various other planes were used to some extent for elementary training in both services. These planes, excellently constructed in proportion to the progress of aviation at that time, have left a long record of service behind them. They are passing now, not because they were not good ships, but because modern ships are better.

The next essential was organization of flight training. Schools were established at various army fields and naval air stations throughout the country. At these, regular courses of training, providing for instruction in all essential maneuvers and for tests to be passed to secure a pilot's license, were pursued by students. But at first the complement of these schools presented a problem. There were not enough qualified pilots in the country to man them. The instructors themselves had to be first trained. Time was pressing, and more than one man who would now be considered as a decidedly doubtful and unpromising student found himself sitting in the forward cockpit as an instructor.

Naturally instruction was far below its present effectiveness. It takes a thoroughly experienced pilot to be a good instructor, and the great majority of instructors were only just beginning their experience. There was little past performance on which to base instruction methods, and the need for haste precluded any delay for experimentation. Actual training was therefore left largely to the individual. The squadron provided planes, mechanics, good advice and ambulances. The instructor and his student started off, and between the two of them the latter was supposed to learn to fly. The surprising thing is not that some didn't but that so many did. But naturally the ambulances were not idle. Many a man soloed watched by an instructor whose official confidence covered some very uneasy private misgivings. To the squadron crashes were merely a matter of routine.

In the immediate aftermath of the war flight training did not differ at all in general organization from that of previous years. It was somewhat more effective, not because of any new conception of it, but because of the increasing experience of instructors. Courses were still sketchy and incomplete, while standards of proficiency required were comparatively undeveloped. Civil aviation took after military in this respect. Instruction sufficient to enable a student to stay in the air right side up for five minutes was considered flight training. If he happened to crack up the next day that was too bad. It was merely chalked up to the perils of the air. Consequently aviation training was still a thing only for the whole-souled enthusiast. It was not yet for the average man.

With the passing of time and the accumulation of experience, flight training in the Army and Navy was seen to be unsatisfactory. The quieter years of peace provided the opportunity for more mature analysis of methods and results. It was found that the great majority of students eventually became competent pilots. Yet some of them wrecked a great many planes during the process. And there was too large a percentage of students who met with serious accidents either during training or shortly thereafter. Obviously, safety in flight training was not being given sufficient consideration.

During recent years there has been a very salutary development in the opposite direction in service flight schools. Methods of instruction have been more carefully worked out. A more thorough ground training is given. Detailed descriptions of all maneuvers are provided for study prior to practical instruction in them. The dual period has been extended to a minimum of ten (*Continued on page 262*)

AIR—HOT AND OTHERWISE

Bouquets and Brickbats

Help Wanted!

Frank A. Tichenor

LAST month we spoke emphatically. We knew our plain words might offend individuals who, though unthinking or mentally diagonal nevertheless are or want others to believe they are of importance in American aviation. But no cop must mind resentment from the crook whose head he smashes, no parent must be worried by the temporary temper of the necessarily scolded child, no schoolmaster must get sore because little Willie, while being paddled for his own good, snarls and tries to kick a pedagogic shin.

We have had proof that the industry, speaking generally, liked what we said. Our advertising pages this month show one of the details of their very favorable reaction. Letters we regret we have space to comment on but slightly. One of these notifies us of delight because American aeronautics has one publication ready to fight for the things all know to be right though by some they are side-stepped because they may be unpopular. Our chest swells; we have lost two buttons from our vest, in fact.

AERO DIGEST naturally must dislike to disapprove the action of any who have been its friends, but it strives for the big kind of wisdom which will lead it to give unwelcome counsel to its very closest pals, e'en to its bread and butter if need be—if and when it sees them so proceeding as to endanger the very industry to which it, THE DIGEST, as well as they, the advertisers, must look for prosperity.

If AERO DIGEST can but act as a high-power binocular helping the industry to see ahead and prepare for the great future which we know awaits American aviation, it will feel that thereby it serves the purpose for which the good God lets it live. If this entails the utterance of violently cross words—well, listen and you'll hear 'em. We don't know how to pussyfoot. We are war birds, on occasion, as we are doves of peace at other times, and when we're war birds we ARE war birds. Nothing else could satisfy the lusty mental appetites of those whose usefulness and glories we declare—the aviators of America.

We have had far more bouquets than brickbats.

FIGHT? That's what the F in AERO DIGEST would stand for if any F was there. There's an F in fly, though.

"You have had an active scrap with a strong enemy whose mere growls have scared off very many in the past," another writes. "We believe your little battle is more than one-half won and a battle only has two halves. You will receive our advertising support to the fullest degree and please send us 100 subscription blanks. You deserve the moral and the money support of every fair-minded air-minded citizen of the United States."

That helps some!

For these kind words we are duly grateful. They help us not to mind the bricks which have been shied at us. The bricks may bruise us slightly where they strike, but wounds are an expected part of warfare.

THE story of aviation in America will be, in the last analysis, the story of an educational movement. The readers of this magazine who really try to understand the situation can do wonderful things toward advancing American interest in this art if they have a nose for fact and can smell the difference between right and wrong instruction. Perhaps it is a job especially for those with young and vital minds and blood circulation, although even the elderly, despite the adage about old dogs and new tricks, may learn the truth.

When an old dog that positively will not learn turns up in the air-minded crowd, he is likely to be run over on the ground by the planes as they take off. It is not the function of this magazine to attempt instruction of the senile, the venal or the bureaucratic. The senile sooner or later will be buried, the venal will be jailed and the bureaucratic will be spanked in that particular region where pants strain most when bent. The naval or military expert who stoops to conquer takes a chance. Gee, what a mark! Pardon if my pen shakes from a premonitory titter.

We shan't get anywhere, brethren of the Real Air Klan, by trying to reform those of bad ethics, those of bad judgment or those who are dead from the neck up. There are enough good folks to take up all our time.

What we must do is to catch the vast mass of Americans young and give them a chance to learn the truth. Knowing the truth, they'll duly wallop papa, or even grandpapa, back into the living line of progress, or into the political and commercial cemetery.

NEARLY nine years have elapsed since the Great War banged its tired way to a Peace which by its imperfections already has taught the younger generation very much.

The boy or girl is now a voter who was fourteen years old when Joyce Kilmer, a believer in airplanes and the brilliant author of the poem "Trees", was killed among the first American victims. Time flies faster than the airplane.

If just after the Armistice we had taught the sixteen-year-olds the sense and science of aeronautics they would be twenty-five years old today and working side by side with us at the tough job of teaching Congress that all is not gold that glitters when dealing with the Army and the Navy.

Then the disclosures of the Congressional Select Investigating Committee would have been followed only by the time necessary to bring on an election before every dud would have been removed from the two national chambers and air-minded Congressman, warranted highly explosive if anybody tried to stop our air progress, would have been put into their places. Our national defense system would have been cleansed ere this of every enemy of air development.

We would have been today a nation instead of periled as we surely are; we would have been a nation in the van of progress rather than one requiring strong binoculars in order to catch sight of Progress's tail as it scoots ahead of us toward the horizon.

I can't pronounce the name of Czecho-Slovakia to my own or anybody's satisfaction, but I can admire what that almost brand new nation has accomplished. Today it has an aeronautical organization comprising over 100,000 members not one of less than 5000, like our own; and the Czecho-Slovakian Air Clan headed by no codfish, cuckoo clock nor weasel, but by the President of the country.

Czecho-Slovakia has a population of 13,615,000. The United States contains 117,000,000 people. The Czecho-Slovak revenues and budget balance at about ten million dollars annually. The United

(*Continued on page 254*)

PROTECTING our FORESTS from FIRE

By Lieutenant N. B. Mamer

Senior Pilot, Air Forest Patrol, District 1

Observer Jost, Pilot Mamer, Pilot Henry, Mechanic Carroll, Observer Flint and Mechanic Cooper.

A BREATH of warm air stirred through the dim recesses of the army hangars wherein were housed the big Liberty motored DeHavilland planes of the District Air Forest Patrol.

A whirling dust devil shifted flittingly across the dry bed of the hard surfaced flying field, disappearing spirally into the smoke haze at the farther end of the field.

The jingle of a telephone bell on the hangar wall broke the stillness of the stifling July afternoon for the patrol pilots.

"Hell apopping on the Kaniksu", exclaimed Chief Observer J. E. Jost, turning from the telephone. "The supervisor wants a two ship patrol in the Priest Lake Country; dry lightning storm just passed there. Mamer and Flint will work the west side to the Canadian Line. Henry and I will work the east side along the Pend O'Reille divide."

A moment later mechanics were busy rolling the lumbering DH's out on the line to be tuned up, while pilots and observers were preparing maps of the country to be scouted, inspecting parachutes and attending to numerous details incidental to preparation for a patrol flight.

The first part of the journey carried us over the checkered and varigated fields of the cultivated land lying between Spokane and the National Forest area. This slightly rolling landscape with its tinted grain fields and numerous emergency landing fields soon merged into the scattering timber patches and cutover land on the fringe of the forest. Directly below, Mt. Spokane, its wind swept summit 6500 feet above sea level, slipped quietly past.

The green of the forest now lay in an unbroken stretch to the north and east. Twenty miles ahead Priest Lake, its mirror-like surface shaded here and there by the shadow of a straying cloud from the passing storm, and cool depths stretched for almost thirty miles into the heart of the Kaniksu Forest.

To the right projected the sharp rugged peaks of the Pend O'Reille divide from whose slopes the timber extends to the shores of Priest Lake.

To the left, on the west side, lay the Priest Lake divide, the country we were headed for. At 8000 feet above sea level hundreds of square miles of country were visible. The average elevation of the ground being 5000 feet, our working height above the ground was approximately 3000 feet.

As we neared the main body of timber, myriads of small wisps of curling white smoke projected upwards, standing out in sharp contrast to the deep green of timber. Scanning our maps carefully, Granite Creek below was selected as our control point. Circling this drainage at a point where it enters Priest Lake to ascertain correctly its identity, our course was set parallel to it toward the first of these telltale wisps of smoke.

Spiralling over the first smoke we descended to within a few hundred feet of the timber. The work of the lightning was plainly visible. A small but growing red flame sprouted from the torn and shattered trunk of a forest giant. The position of this fire, after careful checking, was placed on our contour maps by dotting with a red pencil. A detailed description of its size, condition and probable rate of spread, together with other valuable information was entered on the observer's message sheet.

Moving on to the next smoke the same procedure was followed.

When the head of the drainage was reached, some ten or twelve miles from its mouth, eleven lightning fires had been accurately located and the necessary information on each one recorded.

Our task seemed endless. We had been flying an hour and thirty minutes; the path of the lightning storm spotted a strip from ten to fifteen miles wide by thirty miles long. The eleven fires we had worked were but a small percentage of those visible. If only there had been some way we could have

A typical forest fire, a devasting mass of flame and smoke.

(Continued on page 246)

ENGINEERING IN AIRCRAFT

PART 2

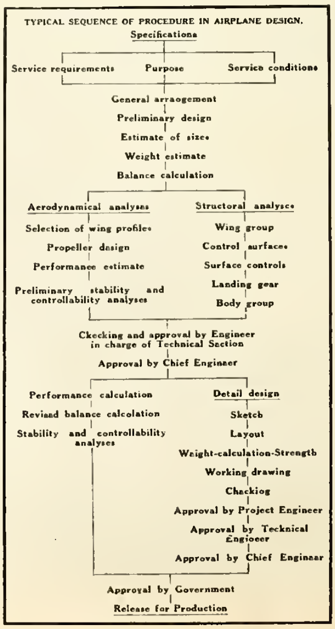
By Dr. Michael Watter

MY previous article dealt with preliminary design and aerodynamical analyses, covering the general considerations and specific aerodynamical problems which form one part of the design. I pointed out that the aircraft of today is not a result of haphazard design nor artistic imagination, but a logical engineering product created to meet definite requirements, withstand known conditions and render efficient service.

A new design entails a complete and scrupulous investigation. What may seem an uneventful sequence of engineering investigations actually is a continuous conflict between performance, cost, weight, strength, service requirements, etc. Having described the aerodynamical analyses required to ascertain the performance of new craft let us now pass on to the still more serious problems of structural design.

I would like to emphasize here the importance of the structural phase of design. Besides structural safety of the craft careful structural analyses can ensure better aerodynamical performance and increased useful load. An aerodynamically perfect project may be a total failure on account of dangerous vibrations; excessive flexibility may change entirely the angle of attack and the craft may fly under conditions totally different from those contemplated by the design. An invention may seem most promising aerodynamically and yet mechanical and structural problems may have by far the greatest bearing on the successful outcome of the whole idea. This is realized by aeronautical engineers and as a result structural problems are given most careful consideration. The necessity of keeping the structural weight as low as possible necessitates the use of the most refined methods of calculation and a most careful selection of aeronautical materials gives us a surprisingly accurate knowledge of the strength of the structure.

Aeronautical structural problems are ordinarily more difficult of solution than problems in other branches of engineering, due partly to closer margins adhered to in aeronautical engineering and partly by the natural complexity of the structure. Members subjected to combined loadings, trusses in space and torsion of complex trusses are common occurrences in an aircraft design. In his battle with weight the aeronautical engineer has to resort to the most modern methods of attack in order to be very successful.



The first move of this offensive fight is the main structural analyses covering the wing group, control surfaces, surface controls, landing gear and body group. In order to arrive at required sizes it is necessary to consider all the various conditions in the service of the craft. The craft must be able to take off, fly and land, sometimes to be catapulted and arrested by means of special devices; besides it may be a convertible land and water craft or an amphibian. In flight there are maneuvers that present different conditions of loading which may be designing conditions; that is, they may present the worse conditions of loading for different members. To illustrate the extent of structural analyses I am giving a list of designing conditions used in practice in structural analyses of a convertible land and water type fighter. These analyses include:

Wing group:—High incidence; low incidence; inverted flight; nose dive; catapulting; unsymmetrical loading condition; tipping over; hoisting.

Body Group:—High incidence; torque load; low incidence; maximum elevator and stabilizer load; maximum fin and rudder load; launching with a catapult.

(*Land plane*): Level landing; three point landing; landing with side load; nosing over; deck landing.

(*Seaplane*): Landing—reaction inclined; landing—reaction vertical; side load.

Control surfaces and surface controls are designed for a specified loading of controlling and stabilizing areas and a certain force applied by the pilot. The land type landing gear is designed for level three point and side loading landing; water type gear is designed for landing with vertical and inclined reactions and side loading conditions.

In a commercial craft the design conditions are not so numerous and the American Safety Code and Air Commerce Regulations set forth the conditions and factors for which a machine must be designed. The structural analyses serve not only to obtain the loads in and loading of various members but are also used to design the structure in the most advantageous way and in this respect must parallel the general design. The structure must meet many requirements such as: most economical arrangement, proper use of materials, ease of assembly, ease of inspection, accessibility to cockpits, storage convenience, etc. Having analysed and considered all these points, a decision is made on the type of the structure to use and analyses are started preferably in the order given in the accompanying chart. In certain cases this order should be altered or portions of the work may be carried on simultaneously but the analyses are always carried though in such a way that the fewest assumptions are made. Should one begin structural analyses with analyzing the fuselage he would be forced to estimate, for instance, wing reactions for flying conditions, landing gear reactions for landing conditions, etc., thus complicating the work and losing out in accuracy. While the procedure suggested should be considered as preferable, production requirements may interfere and necessitate an alteration of the process. In such cases it is well from the standpoint of economy to resort to a short-cut analyses instead of guessing. After the analyses are completed a revision is made to see whether any members are affected to an extent warranting a change in sizes.

In making the wing analyses in the case of a biplane or a multiplane, it is important to know the distribution of lift between the wings constituting the cell. There is enough direct information on an ordinary cell constituted of two identical airfoils without decalage. The decalaged cell, or cell with different airfoils, presents a more complicated problem and in order to start his analyses an engineer goes through an aerodynamical analysis of the cell in

(*Continued on page 252*)

AERIAL LIFE SAVERS

By Kenneth D. Stern

TO Major Edward S. Hoffman belongs the distinction of developing the most successful aerial life belt—the Irvin seat pack air chute, now universally used in this country and abroad. Under his direction at McCook Field, this parachute was brought to its present high state of perfection by the Army Air Corps, and without the loss of a single life in experimentation.

For this outstanding development Major Hoffman has been awarded the Collier Trophy for 1926. In the records of the Army Air Corps alone, this parachute, which is manufactured by the Irving Air Chute Company of Buffalo, N. Y., has saved twenty-six lives.

The Caterpillar Club, an organization of flyers whose lives have been saved by the use of an Irvin air chute which is made from silk, a product coming from the lowly caterpillar cocoon, now has over thirty members. Their tales of escape from death when they were forced to take to their life preservers of the air make thrilling and colorful telling.

One of the most unusual of them is that of Mrs. Irene McFarland and Major Hoffman. As the climax of an afternoon of stunt and exhibition flying at Grisard Field, Mrs. McFarland was to make a parachute drop. The altitude was to be 3500 feet. She had made a practice jump that morning.

Her equipment was a canvas exhibition chute, which when packed into a bag was fastened to the undercarriage axle of a plane, between the wheels. The rip-cord of the affair was a rope which was attached to the parachute stowed away in its container. When the parachutist jumped the weight of the body was supposed to pull the parachute out of its canvas bag container and leave the umbrella free to billow out. The mouth of the bag-container did not close. Its edges met in a circle somewhat smaller than the original circumference of the bag, leaving the white canvas of the packed chute and its shroud cords showing. At this stage of the packing the mouth of the bag was woven together with strands of linen tape which prevented the parachute from billowing loose prematurely by its own weight, which was exerted downwards. Mr. McFarland packed his wife's parachute in preparation for the exhibition jump that particular afternoon.

After the pack was finished, Major Hoffman, commandant of the government reserve airport then located at Grisard Field but since removed to Lunken Airport, who had been standing close by observing the operations, decided that the paraphernalia with which Mrs. McFarland was to make the jump looked unreliable and unsafe.

There is a government regulation which forbids anyone flying from a government field without the Irvin chute. As Mrs. McFarland was performing at a government airport, the Major decided to enforce this regulation.

He brought out a seat-pack chute with its harness and instructed Mrs. McFarland to wear it. She at first demurred. It would be too clumsy, added to the other harness she wore, the young lady said. The Major insisted. Mrs. McFarland donned the additional chute and had difficulty in getting in and out of the forward cockpit of Lieutenant Watson's plane.

The additional harness necessitated placing the harness of her exhibition chute further up on her body. The rip-cord rope leading from it to the mouth of the bag slung to the undercarriage axle was now too short. She could not easily get out of the cockpit. Mrs. McFarland complained of these and other things again and again, but the Major was adamant.

The Irvin Air Chute floating smoothly down to earth.

Finally, with some more adjusting, the harnesses of the two parachutes were arranged to Mrs. McFarland's satisfaction and comfort and Major Hoffman gave her final instructions as to how to pull the rip-cord ring of her emergency parachute. She waved to the crowd and the plane took off.

A light breeze was blowing in the direction of flight. At 3500 feet Lieutenant Watson, her pilot, swung in over the field. The time had come for the jump.

The massed crowd on the ground saw a figure appear at the edge of the cockpit and leap over the side of the fuselage. But it did not drop as was expected. Instead it swung there helplessly, suspended by a rope a few feet beneath the plane. The taping at the mouth of the bag had failed to give way with the impact of Mrs. McFarland's weight and she had become a pendulum, swaying from the plane 3500 feet above the ground in space.

Her white face peered up at Watson. He motioned her to pull the rip-cord of the emergency pack. She did. The next few seconds were fraught with peril for both Watson and his fair performer.

When the government chute opened, its folds jerked the figure swinging from the bag backward and downward, breaking loose the exhibition chute. But the silken folds of the opening parachute blew back into the elevators. Watson desperately sent the plane's nose up to free the tail of its clinging menace.

It all occurred in a few breath taking seconds. The crowd did not know what was happening.

The government chute at length began lazily to float Mrs. McFarland groundward, the folds of her own clinging uselessly together throughout the whole descent.

While Mrs. McFarland went up primarily for an exhibition jump by her own parachute and did not intend to use the government pack except for emergency, the fact that she had the latter saved her life, thereby admitting her to membership in the Caterpillar Club.

These parachutes continue to save lives regularly and in each instance reflect glory on Major Hoffman, the Irving Air Chute Company and members of the Army Air Corps who aided in the development.

PITCAIRN AIRCRAFT

by Donald F. Rose

THREE years ago Pitcairn Aviation first began operations on an eighty acre field at Bryn Athyn, Pennsylvania, where Harold F. Pitcairn, president of the company, built a hangar, and began flying operations. Curtiss Orioles did most of the work, and a couple of air-meets placed the field on the air map. Lots of passengers were carried, a flying school was opened, and James G. Ray, one-time army instructor, Curtiss pilot, and so forth, assembled the nucleus of the present Pitcairn crew. In the meantime Agnew E. Larsen was evolving airplane designs, and preparing the framework of a manufacturing organization.

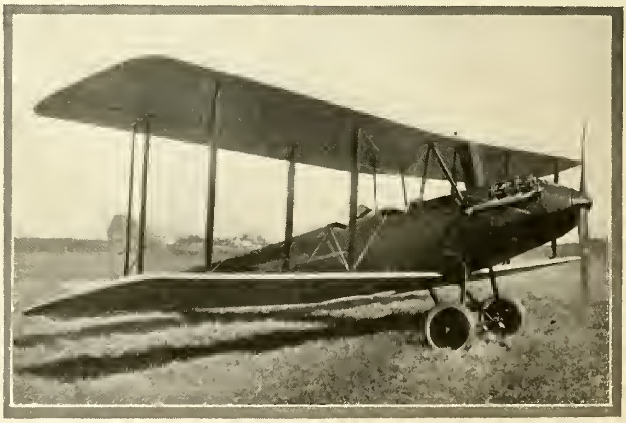
The first ship out of the young factory was the Fleetwing,—designed specifically for the requirements of a passenger-carrying field. It was a nice job, with a high efficiency rating, and proved itself so satisfactory that a second was soon under construction. In the meantime flying operations were transferred, early in 1926, to the new Pitcairn Field at Hallowell, Pa. This field, with a total acreage of about 300 acres, 190 of which are cleared for business, lies along the Doylestown Pike, part of the Lackawanna Trail and a direct highway from New York State into Philadelphia. The new location immediately proved its desirability. In 1926 a total of 15,236 passengers was carried in the Pitcairn fleet, as many as three hundred being flown in a single day.

The old hangar at Bryn Athyn thereupon underwent a successive transformation into a factory. Second and third floors were built into it. A woodworking shop, machine shop, doping shed, storage buildings, and heat treating equipment were added. Early in 1926 the second Pitcairn design came through under the name of Orowing, a three-place job built around the OX motor. Two of these were put into operation at Pitcairn field, and tested and tried in all varieties of commercial service; one successfully negotiated the 1926 Commercial Airplane Reliability Tour; one spent a good part of the summer working on the Ocean City beach. Pilots, passengers and students united in satisfaction with the new ship and the factory organization, now complete and fully equipped went into a production schedule.

In the meantime there were the National Air Races and the Pitcairn Sesqui-Wing. This neat little messenger plane emerged from the factory two days before the Races. Only one member of the Pitcairn organization preserved his calm and poise in the face of the trial flights, and that was "Jimmy" Ray, who, in addition to manifold duties and responsibilities as manager of flying operations, is the official test pilot of the Pitcairn Company. And in the dusk of the summer's day, Jim took Sesqui-Wing into the air, and she flew like a streak, receiving Jim's expert approval and endorsement as a fit and proper plane to carry the Pitcairn banner at the meet.

Her first appearance on Saturday, won her a second place. This was considered good, but not good enough. The ship went back to the factory, and the factory crew stayed up nights getting the ship ready for the next race. Additional streamlining was added, new propeller installed, and sundry minor changes made in under-carriage and cowling. On Wednesday, Sesqui-Wing, piloted by Jim Ray, walked away with the week's principal speed event for commercial aircraft, amid the enthusiastic cheers of the assembled multitude.

A feature of the Sesqui-Wing that attracted considerable attention and is of commercial importance, is the provision made for rapid change of engines. To permit entry in two events for planes of different power on the same afternoon, the Pitcairn mechanics actually substituted the C6 for the OX5 motor in thirty-one minutes by the clock from the time the propeller came to rest to its restarting with the second engine. This feature, which is based on carefully-studied design, has considerable value in the operation of planes over regular air-routes, where spare engines may be kept in reserve and quickly installed in case of motor trouble.



Pitcairn's principal production plane, the OX5 engined Orowing.

Present activities at the Pitcairn plant are principally devoted to the Orowing. The production of this plane represents a studied effort to reduce costs through manufacturing efficiency, while at the same time maintaining a high standard of workmanship. There are also a number of outstanding points of interest in the design of the Orowing, looking to the especial needs and demands of commercial operation. There is unusual sturdiness in fuselage construction, exemplified in substantial cross bracing and in the high grade practice employed in welding. Points of special stress or wear, such as the tail-skid swivel and the swivel attachment of the undercarriage are provided with bronze bushings that may be easily renewed. Cowling design permits easy access to all parts of the engine, and at the same time effectively protects it against bad weather. Gasoline tanks are of aluminum, and may be easily removed. Tail skid, shock absorber unit, and other parts needing periodic replacement are designed for removal with a minimum of trouble. The engine mount and engine bearers are designed to insulate engine vibration from the fuselage. These and many other features definitely look to reduction of operating costs and the elimination of interruption to flying service.

Specifications of the Pitcairn Orowing

Span, upper wing	36 ft.
Span, lower wing	35 ft. 11¾ in.
Chord, both wings	60 in.
Gap	64⅞ in.
Stagger	14¾ in.
Incidence, both wings	2½ deg.
Dihedral, both wings	1½ deg.
Length over all	26 ft. 2 in.
Height over all	9 ft. 2½ in.
Weight empty	1345 lbs.
Useful load	755 lbs.
Passengers	340 lbs.
Pilot	170 lbs.
Gasoline	180 lbs.
Oil	32 lbs.
Water	33 lbs.
Weight loaded	2100 lbs.
Area of wings	338.37 sq. ft.
Area of horizontal tail	33 sq. ft.
Area of vertical tail	13 sq. ft.
Power	90 h. p. at 1400 r. p. m.
Wing loading	6.2 lbs. per sq. ft.
Power loading	23.2 lbs. per h. p.
Wing section	Modified RAF-15

The flying characteristics of the Orowing are distinguished by inherent steadiness, excellent behavior and responsive control in rough air. This and other features make it particularly suited for student flying, for which purpose Orowings are in regular use at Pitcairn Field. Dual control is standard equipment.

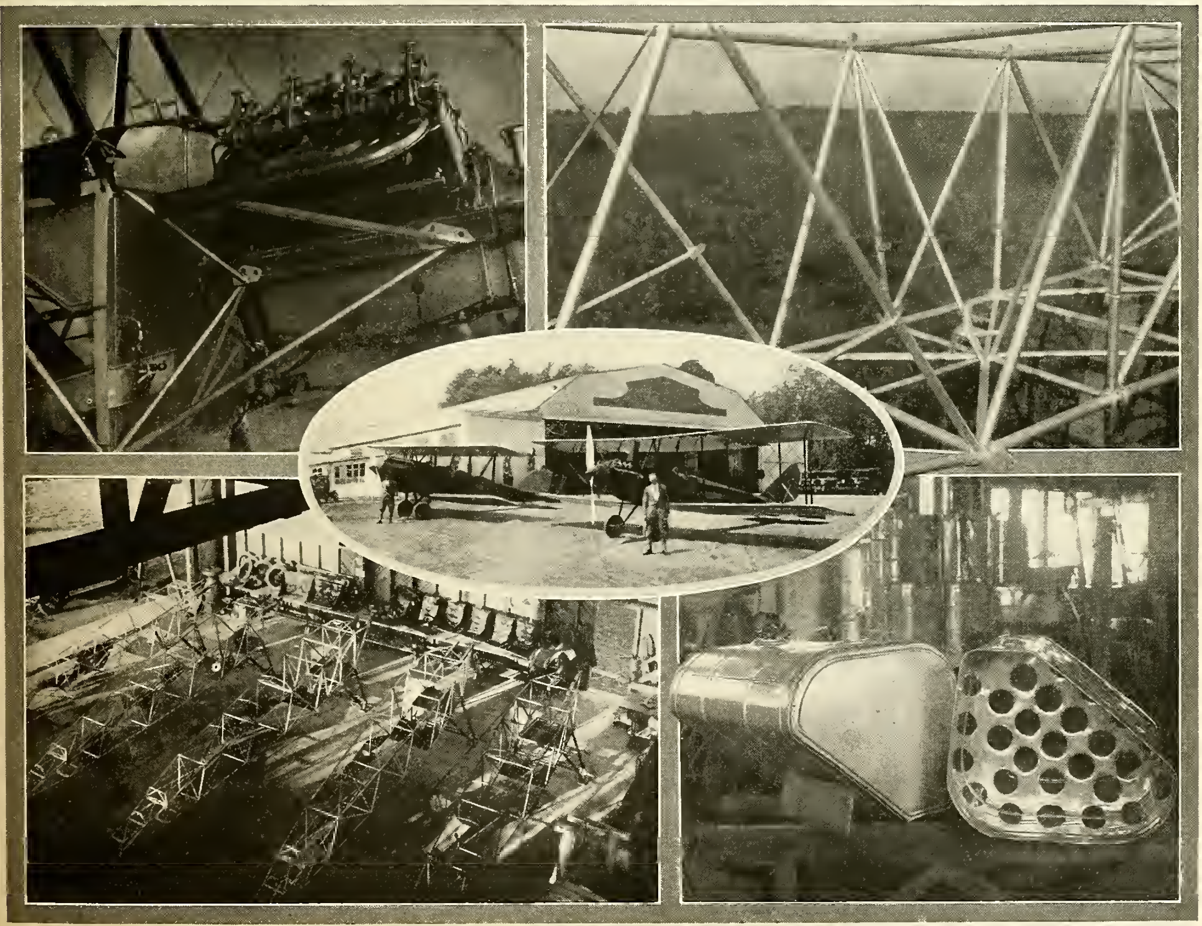
The performances of the Orowing are as follows: maximum speed, 90 m.p.h.; cruising speed, 80 m.p.h.; minimum speed, 45 m.p.h.; service ceiling, 10,500 feet; cruising range, 400 miles; endurance at 80 m.p.h., 4 hours.

An attractive color scheme has been adopted—the body, wing struts, landing gear and exposed wires and fittings are painted in black; wing surfaces and all tail surfaces are finished with yellow pigmented dope.

The Pitcairn "Fleetwing" is a 5-place passenger carrier with 3 separate cockpits; two two-place cockpits forward and the pilot's cockpit at the rear where the maximum vision is obtained. A Curtiss C-6 engine giving 160 h.p. at 1750 r.p.m. is installed. Fuel is fed from twin gravity tanks in the center-section wing panel. Sufficient fuel is carried for a duration of three and one half hours.

The "Fleetwing" has an upper wing span of 38 feet and lower wing span of 33 feet. Overall length, 25 feet 11 inches. Height, 10 feet. Fully loaded, the machine weighs 2879 pounds. Wing loading, 8.24 pounds per square foot. A useful load of 1077 pounds is carried which includes 182 pounds of gasoline and passengers and pilot totalling 800 pounds. With full load, the high speed is 106.2 miles an hour.

Coincident with the factory activities the flying field has put in a fairly busy winter. All flying equipment has been overhauled and the flying school has maintained its activities without interruption, with an enrollment varying from 25 to 30. The field is in excellent condition, equipment is complete, and public interest and confidence have been firmly established by the conservative and successful operation of last year. There is a bright prospect for the present year and record breaking activity is anticipated.



Some construction details of the Pitcairn Orowing showing steel-tube fuselage, engine installation and main fuel tanks.

THE PHYSICAL STANDARDS

Of the New Air Regulations

By Arthur La Roe, M. D.

Captain, Medical Officers' Reserve Corps

THE Editor asked me to discuss the physical standards for airplane pilots as required by the Aeronautics Branch, Department of Commerce, in the recently issued regulations—and in as small amount of space as possible, and in such a way as will be intelligible to the layman. This is probably a very easy request to make. Complying with it may prove to be another matter. I trust that my lay readers may forgive me if I am not entirely clear, and that my confreres may bear in mind that the lines are written with the layman, not themselves, in mind.

Johnny, aged five, after repeated demands, had been told by his Mother that only the doctor knew where the new little baby brother came from. So he waylaid the old gentleman on the front porch and demanded a complete exposure. "Well, my little man," he was told, "I had to go to school for five years to learn all about that, and I haven't time to stop now and tell you." I am more or less in the same situation. It isn't easy to make clear explanations on these physiologic subjects to those who do not have the foundation of physiology.

I would like to insert a word of praise for those responsible for the drawing up of these medical regulations. They represent a very delightful medium between the strict requirements of the Army "609," which might have been disastrous to commercial aviation, and the complete absence of regulations under which we have so long suffered. They are certainly as nearly perfect as are the Air Commerce Regulations themselves, judging them by the manner in which they have been received. If any pilot objects to some provision it will almost certainly be for a lack of understanding of the physiologic principle involved.

First, there are three classes of requirements corresponding to the three classes of pilots—Transport, Industrial, and Private. The strictest regulations, of course, apply to the Transport pilot, and in addition he must be examined once every six months. The other two are to be examined annually, the requirements for Industrial pilot somewhat less strict than for Private pilot, which latter are decidedly lenient. In all classes reëxamination is required after suspension or revocation of license following accident or illness. Exemptions are granted for six months to Transport, and for one year to Industrial and Private pilots, who can present certified copies of physical examinations qualifying them to fly in army, navy, or marine corps. A very happy provision is contained in Section 7—in the case of trained, experienced pilots the Secretary of Commerce may grant waivers for defects ordinarily disqualifying when in his opinion the experience compensates for the defect. Of necessity, this is treading on dangerous ground, but in the proper hands this provision is not likely to be overworked.

Many of our best flyers will fly on these waivers, and I can see no reason from the Flight Surgeon's point of view why this should not be so. The late Charles Ames of the Night Air Mail flew for years with his right knee completely rigid and with an infection in the joint which drained pus through several openings into the joint, and necessitated daily changes of the surgical dressings. Although I have heard it so argued, it is entirely inconceivable to me that that handicap had anything whatever to do with the unfortunate accident which caused his untimely end. Two of the French flyers who are planning a flight across the Atlantic together are handicapped, the one with the loss of an eye, the other the loss of a leg. Like the two heroes of Robert W. Service in "The Haggis of Private McPhee" of the Red Cross Rhymes—"And why should we miss it? Between you and me, We've legs for tae run and we've eyes for tae see."

This does not indicate however that it would be the part of wisdom to grant hither and yon licenses to a lot of one-eyed and one-legged pilots. No two men accept even the same handicap with equal degrees of equanimity. What to one is an inconvenience to be overcome with a little grit, is a complete disablement to another. The one goes smilin' through, the other slumps down in a slough of despond and awaits the dismal end.

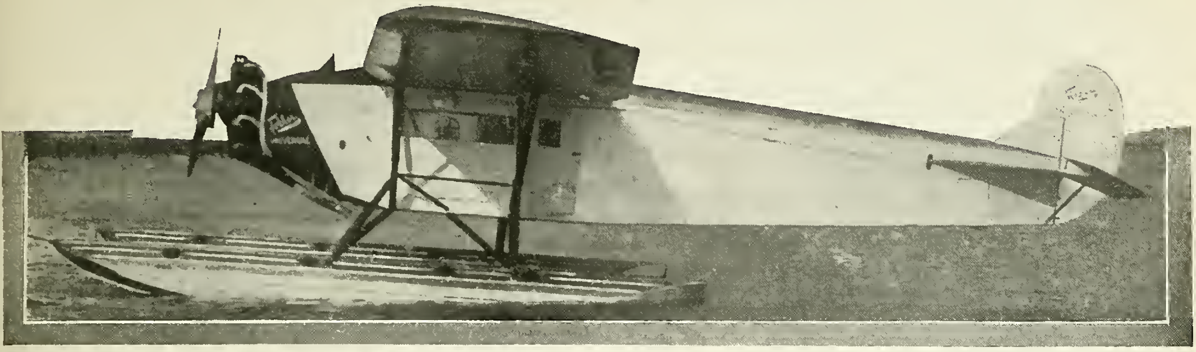
Section 8 provides that examinations are accepted only when made by physicians designated as qualified by the Secretary. This, for the present at least, will mean only graduates of the Army's School of Aviation Medicine formerly at Mitchel Field, now at Brooks Field (in the big balloon hangar) at San Antonio; of the Navy's new school just being organized in the Naval Hospital in Washington; and possibly a few others. This is not surprising. Insurance companies prefer and always have when possible examinations by their trained physicians. These are made with a thought of longevity in mind and conditions are sought out that are likely to cause an early death. An examination by an average general practitioner or even a specialist in some other line would be much less satisfactory. Similarly the Flight Surgeon has been trained to consider his man always with the thought in mind of the various exigencies of flying. A blind man might suit an insurance concern very well, but he would not make out in aviation. And some types of insanity are conducive to long life—outside of aviation.

In cases of reëxamination the physician may requalify the applicant only if he presents a sworn statement of flying time as follows for the three classes: Transport, 10 hours in past 60 days; Industrial, 25 hours in past year; Private, 10 hours in past year. Section 9 provides that this requalification by the physician shall hold pending the approval of the record of examination by the Department, and the issuance of the card to the pilot.

Very probably no physical function is more important in flying than vision. Sections 10 to 17 inclusive deal with the functions of the eye. The eye is a camera or vice versa) with a lens and a plate or film. This latter is the retina, a delicate membrane composed of several layers of minute cells called rods and cones, each being the ending of one of the tiny filaments of the optic nerve. The light falling upon these cells, light being a vibratory form of energy, sets them into vibration, sending back to the visual center of the brain the sensation recognized as vision. This is located at the back of the brain, just under the 'bump" known as the occiput. The rays of light must be converged and brought to a focus, or to a series of foci, on the film or retina as the case may be. The camera does this by moving the lens nearer to or further from the film, or by changing the lens to suit the purpose. This would sometimes be convenient in the eye, but it is not possible. For our usual needs, the system is far better than that of the camera. Instead of being of a solid material as is the lens of the camera, the crystalline

(*Continued on page 249*)

THE FOKKER UNIVERSAL SEAPLANE



WITH the successful tests made in February at Miller Field, Staten Island, New York, of the Fokker Universal 5-passenger monoplane on pontoons, the development of the truly universal adaptability of this airplane for all commercial purposes was successfully completed.

As a land plane, the Fokker Universal was first brought out in October, 1925, and proved a complete success. Subsequently, the two planes of this type purchased by Colonial Air Transport, Inc. have given splendid service under the very hard conditions pertaining on the New York-Boston air mail route. As land planes also, two Universals delivered to Mr. Edward Hubbard of the Northwest Airlines, Inc., Seattle, Washington, created quite a sensation on the Pacific coast where many hundreds of passengers have been carried in them with the utmost comfort afforded by the excellent cabin arrangement and silent exhaust.

The next stage in the development of its universal application was the fitting of skis for service in the Red Lake gold fields district in northern Ontario. The purchaser was Western Canada Airways, Ltd. of which the financial backer is Mr. James A. Richardson, the well known grain merchant of Winnipeg. This Universal was flown away from the Atlantic Aircraft Corporation factory, Teterboro Airport, Hasbrouck Heights, N. J., early in December, on wheels, the skis being carried in the cabin together with about 800 pounds of other supplies and a mechanic, piloted by Captain H. A. Oaks, the manager of Western Canada Airways, Ltd. Darkness and a blizzard terminated the flight for that day just outside of Buffalo, New York; the following morning the snow had deepened to such an extent that to take off with wheels was impossible, and it was fortunate that the skis were in the ship. They were substituted for the wheels at once and the flight continued.

The Fokker Universal was test-flown with twin pontoons at Miller Field, N. Y.

After the necessary Air Board and Customs formalities at Toronto, the long journey to Hudson, Ontario, Western Canada Airways' operating base, was completed on Christmas day. On the termination of this long winter flight, made under arduous conditions, Captain Oaks telegraphed his enthusiastic commendation of the plane. Since his arrival at Hudson, Captain Oaks has been flying a 300-mile route through the Red Lake district, practically daily. Passengers, mail and all kinds of freight are carried and four stops are made along the route, at different centers, for unloading and picking up new loads.

Captain Oaks returned to New York for the purpose of witnessing the tests of a Fokker Universal on pontoons. These tests were so successful that Western Canada Airways, Ltd. immediately placed an order for two more Universals equipped with wheels, skis and pontoon gear for the first ship. Its performance as a seaplane has astonished those witnessing the tests. It has a sturdy, steel under-carriage with duralumin pontoons, the lines of which are the design of the Atlantic Aircraft Corp. and they were manufactured by the Hamilton Aero Mfg. Co. of Milwaukee. In spite of the increase in weight of the empty ship by approximately 250 pounds, it was found that even on entirely smooth water a take off in 20 seconds was made, in several successive tests, with a disposable load of not less than 1480 pounds or within 20 pounds of the full specified load as a land plane. The load consisted of the pilot, four full size passengers and 75 gallons of gasoline, the latter sufficient for over 6 hours' flying.

With a normal full load of 1300 pounds the take off was made in 12 to 14 seconds. These tests were made with the original land plane propeller. The fact that on the seaplane this propeller only turned up some 50 r.p.m. less than on the land plane proves that but little of the performance has been lost in changing the landing gear to pontoons, as was already evidenced by the quick take off and steep climb obtained even with a load equal to 1730 pounds on the land plane.

Main dimensions and characteristics are: span, 47 feet 6 inches; disposable load, 1500 pounds; high speed, 110 m.p.h.; cruising speed, 90 m.p.h.; fuel capacity, 78 gallons; climb, 650 feet per minute.

AERO DIGEST

Published Monthly
THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
220 WEST 42nd STREET
NEW YORK

Vol. 10 MARCH, 1927 No. 3

PASTE THIS IN YOUR HANGAR

LORD THOMSON, former Secretary of State for Air of Great Britain during the Labor administration of the government and whose views, it is believed, represent the prevailing opinion among officials and officers of the Royal Air Force, states among other things:

"* * * There is no mobilization period in air warfare. The first attack by air upon these islands would coincide with, if not precede, the formal declaration of war. Failure to check the enemy's bombing squadrons might cause a state of panic in densely populated areas which, to say the least, would be embarrassing. Defeat in the first aerial encounters, if it were followed by marked inferiority in the air, would expose our dockyards and military centers to incessant bombing, and thus reduce the other fighting services to temporary impotence. The course of the war might be determined during the first ten days. The initial phase might be decisive.

"To meet the menace of air attack, a new defense system has been rendered necessary, whose first line is the Royal Air Force. Inevitably the new organization has been criticized, if not condemned. It cuts across sentiment and tradition, like every other innovation; it encroaches, supplants, poaches on old preserves, and will if it is properly applied, sacrifice the hoariest vested interests to efficiency and economy. Some of the criticism has been constructive and, as such, welcome. . . . But many critics have displayed either ignorance of, or unwillingness to face, the facts of the present situation.

"Naval and military authorities in all parts of the Empire are still apt to regard air operations as in the main auxiliary to their own, and to forget the third dimension. There are still some who carry their obduracy so far as to deny that the first line of defense is in the air. The warning given by Field Marshal Foch upon this subject should be posted in every Admiralty and War Office. It is as follows: 'The potentialities of aircraft attack on a large scale are almost incalculable, but it is clear that such attack, owing to its crushing moral effect on a nation, may impress public opinion to the point of disarming the Government, and thus become decisive.' * * *

"Again, while a first-class airman is a national asset, no country can afford to keep second-rate pilots and mechanics; far too much is at stake. Scouting and spotting for a fleet or army are simple tasks compared to those which are required of a fighting pilot in air warfare. Continuous employment at the former renders the best men less efficient for the latter; and, although the convenience of the other arms should be studied and met as far as possible, the fact remains that every pilot and mechanic in the land must be available and ready for the all-important service of repelling air attack if and when the emergency should arise. In these conditions, the training of all air personnel has to be uniform; the most hopeless confusion would prevail if there were two schools of thought.

"Any scheme of Empire Air Defense must be based on cooperation between the three fighting services. As air forces, because of their cheapness and effectiveness, tend increasingly to replace land and sea forces, many delicate questions of command will have to be settled. In matters of this kind, decisions cannot profitably be based on actual conditions; they should take into account conditions so far as they can be foreseen, at least ten years ahead. Thereby money is saved, the bickering between departments is forestalled and to some extent mitigated. It is, or by now should be, axiomatic, that where a large air force is required, to put it under the control of men, however competent in other respects, who do not understand its functions, is always wasteful, and will often prove to be disastrous. Responsibility for air operations should never be divided. Air tactics are so different from military or naval tactics that only in special circumstances is it possible to combine them; to subordinate the action of units with the mobility of air squadrons to that of units on land or sea is to harness Pegasus to a cart. * * *"

That's from a man who has seen the bombs drop from the air onto his defenseless London—and who has heard the screaming of the women, seen the mutilated bodies of the babies.

Can we of the United States learn nothing from the terrible experiences of others? England was absolutely vulnerable when first the Zeps and then the planes began to hurl down death—but England never was and never could be half as helpless as America would be if an air war were made on us to-morrow, or, even though we worked our fastest and our best, a year or two years from to-morrow.

She is not big enough to be as helpless as we are. She could and can be guarded by a force which to the needs of this great country with ten thousand miles of coast and boundary line would be pitifully small.

BRAVA DE PINEDO AND ITALY!

COMMANDER DE PINEDO has crossed the Atlantic Ocean by airplane. No one yet has made a non-stop flight between the continents which the South Atlantic separates. It was de Pinedo's ambition to do this, flying from Portuguese Guinea to Port Natal, which is near Cape San Roque, Brazil.

He made a magnificent flight by stages of approximately one thousand miles from Sardinia to the Guinea coast. At that point every effort was made to lighten his plane by removing every dispensable accessory. The intrepid flyer even left behind his extra pilot and mechanic to give him carrying power for gasoline assuring him more than a bare margin of safety on the transatlantic voyage. He was willing to take the risk of running short of fuel however, for, after he had tried to get his plane out of the water with the full load and failed time after time, he lightened the craft once more and flew to Porta Praya in the Cape Verde Islands, which are several hundred miles off the African Coast. Therefore it was from this point that his real start was made. The Island of Fernando Noronha, where he made his American landing, is about equally distant from the Coast of Brazil, but the reports at hand indicate that he passed it and went on virtually to the mainland before he returned to make a landing.

No matter how the keepers of the technical records may list his accomplishments, de Pinedo really has conquered the Atlantic Ocean and Italy takes her place with the nations whose aviators previously had accomplished this feat, namely the United States, Great Britain and Spain.

A NOD AND A WINK

The Galloping Goose

By

Cy Caldwell

THE slogan, "See America First", was invented by the manufacturer of a chewing-gum which is mentioned in glowing terms on every billboard in the country. And the reason for inventing that slogan, outside of the pure intellectual thrill of the thing, was to prevail upon Americans to travel at home to see the billboards, instead of gallivanting off to Europe. Over there you travel miles without seeing a billboard. While here you travel miles without seeing any of the country.

However, this slogan has not done the trick. Every year whole boatloads of possible purchasers of American products may be seen sneaking off to Europe, instead of traveling between the billboards, as they're supposed to do. Such a condition cannot be tolerated, of course, so the manufacturers have hit upon another scheme for keeping Americans at home among the signs. Briefly, the plan is to enlist the services of writers, and semi-writers, take their liquor away from them for a few weeks, and thus render them desperate enough to grind out travel stories pointing out the beauty of these United Cigar Stores States. Each writer has been supplied with a railroad time-table as an inspiration, and to insure that he spells correctly the names of the towns in his story. It isn't necessary that he should actually go to any of the places he's writing about. In fact, the theory is that the less he knows about a place the more enthusiastically he'll write about it. Imagine, for instance, the dilemma of a writer who has been in Hoboken, New Jersey—to mention an extreme case—trying to write admiringly of the town.

So when the hiring representative of the manufacturers' association forced his way past not only my two footman, but the butler as well, and dashed in to my study—knocking over a couple of glasses in his eagerness to offer me $10,000 for this article—the first thing he said was, "Have you ever been in Pennsylvania?"

"I have not," I replied with dignity, "though from the price they're paying for votes in that State it seems I should—"

"Stay where you are," he advised. "They'll pay more in New York! Have you ever been up in an airplane?"

"Never!" I answered, absently taking a sip of ink.

"Good!" he said briskly. "You're just the man we want to write an article on air travel in Pennsylvania. Name your fee. Price is nothing to us—and the same to you."

I told him how much I wanted for the article—so many dollars a word, I forget the exact number—and he said that he wanted me to get it. I believe his exact words were, "I'd like to see you get it."

Well, that being all arranged, I got out a time-table of the Pennsylvania Railroad and a copy of the Blue Laws of Philadelphia from which to build up my local color. The result is this article, which I think is bound to do much toward making readers see America first, or South Africa, or some place. I know I showed it to a friend, and he told me that once he started reading it he never stirred from his room until he had finished it, which certainly speaks well for the gripping power of the story. He was in jail at the time. Well, folks, clamp on your safety belts and hang onto your seats, and we'll dash into this bit of commercial literature called:

THE GALLOPING GOOSE OR THE MECHANIC'S REVENGE.

WITH Mechanic Leonard Goebl crouched in the front cockpit of what the manufacturer alleged was an airplane, but which the Air Mail officials claimed was something else again, I left Cleveland, Ohio, on a very cold afternoon in January, 1892, to fly to Camden, New Jersey, and return with one of the new Orfultone phonographs that Tommy Edison or Tony Fokker, or it may have been Bob Hewitt invented. I forget which one of these lads it was, but I think it was Bob. Anyhow, it was the chap who went over to London and was received by Queen Victoria in Charing Cross Station, if you remember that incident, as of course you do.

The dear old Queen—she was growing quite stout then but you weren't supposed to say anything about it to her—she met Bob or Tommy, or whoever it was, on the platform, and said, "The sun never sets on the British Empire," and Tommy came back, quick as a flash, "Why should it?" So that's where that one started. "What can we do to repay your Majesty for wise-cracking us like that?" asked Tommy, or Bob, whoever it was. "I'll tell you, kid," said the Queen, chucking her crown to a lady-in-waiting—I think it was Countess Cathcart, but I wouldn't say for sure—"You rebels over there in the American Colonies are clever sorts of Johnnies. Why don't you invent something to take the place of these phonographs that sound like a Methodist camp-meeting soloist with a cold in her throat?" "All right, Queen," says Bob, winking at one of the ladies-in-waiting. "In Camden, N. J., we have two big factories. In one we can soup, and in the other we can music. We'll turn out something that will sound as good as radio, all but the static."

And I'm hanged if they didn't too. And that's what I was sent after by airplane that day in '92—or was it '93? Anyhow, it seems a long time ago. But I do recall that the country had recovered pretty well from the effects of the Civil War. This plane I flew was the very one Patrick Henry was leaning against when he said, "Give me Liberty or give me DEATH," so they told him to take it up and loop it. But he was too smart for them.

Now, this Len Goebl said that he had always wanted to see America the worst way. So I told him to come right along with me in the Galloping Goose, which was one of the more complimentary names we had for this plane. He got in the front cockpit, which had been built to hold mail, only the Air Mail people weren't easy to fool, and had chucked it back at us. You remember Commodore Perry's famous crack, "Don't give up the ship!" Well, we adopted that as our motto in that little factory in Cleveland. We laughingly renamed the ship The Commercial Plane, and caused considerable amusement wherever we went. "Isn't this the Night Mail Plane?" someone would ask. "No, no," I'd reply, "this is the Commercial Plane. See the dime painted on it—the manufacturer's coat of arms."

I call attention to Len, for that flight marked a turning point in his career. Thereafter he was never the same. He started off very warm. While we were getting ready, tying the plane together here and there and collecting anything that fell off, Len bustled about in his fur-lined flying suit, growing warmer and warmer all the time, until when we finally staggered into the air steam was rising from him. As we swung over Chagrin

(*Continued on page 242*)

"THE KID"

By Victor A. Smith

"GAWD-A-MITY, don't look! That fool Kid is at it again." The C. O. ducked and turned away. I didn't. I knew the Kid. He had taught me to fly and I was used to his hair-raising stunts. But he'd only been with us about ten days and the C.O. and everybody else still threw fits every time he went up. They were all afraid—that is, all but the Kid. "Fear," as Alex Smart, the field fool put it, "wasn't in the Kid's Webster. He didn't Noah the word."

The Kid could do more things with a plane than any man I ever saw and I'd seen 'em all—good and bad. His reputation, like his nickname, had preceded his coming to us, but there was a lot of head-wagging and many doubtful looks the day a dapper little fellow about five feet three inches high, weighing just over a hundred pounds and looking about seventeen years of age, reported for duty as the much touted new instructor.

"Your name," said the C. O.

"The Kid," answered the new instructor.

"I mean your real name. Haven't you one?"

"Sure."

"Sign here," said the C. O.

And the Kid did, this way: T. H. E. Kidd.

"Who'll we notify in case of accident?"

"Nobody," said the Kid, "there ain't gonner be no accident. Me and the American Eagle is buddies."

The C. O. let the Kid get away with it.

About that American eagle the Kid told the truth. An old silver dollar was his luck piece and I remembered how, at another field, he had lost it one night in a crap game. That was three days before pay-day. In those three days he never touched a plane, but the minute he got his money he started out to find his dollar. He paid the robber that had it ten dollars to get it back. Then he went up. Like a blinking idiot, I went with him. On that flight, the Kid invented sky-writing.

By the time he had been with us a week, the Kid was a popular favorite. Everybody, from the C. O. down, loved him. That is, everybody but Bill Brawner. Bill was a great roughneck of a husky, so, naturally, with his initials, he became the original Big Boy, and he had been, until the Kid's arrival, the flying hero of our outfit.

Two days after the Kid reached us, he and Big Boy happened to be up at the same time. The B. B. decided he'd show the Kid up and he started a lot of fancy stuff. The Kid watched him for a little while, then he got busy. He looped and nose-dived and did falling leaves all around the Big Boy. He flew so close to him that the Big Boy got nervous and started to get away, but the Kid was right on his tail. Then, gradually, he got above him and judging his dive to within ten feet of the Big Boy's plane, he pulled off the prettiest noser anybody ever saw. It completely got the B.B.'s nerve and he started down with the Kid just above him all the time, circling around like an eagle after his prey.

The Big Boy came to earth, literally run out of the air. But the Kid stayed up a few minutes longer. By the time he came down, the Big Boy had been pretty well kidded and he was sore. After that he was always making dirty digs at and about the Kid, who stood it like the sport he was until one night when six or eight of us were having a quiet little party. Present were a couple of quarts of white lightning, two or three sets of nice dice and very little money. The Big Boy wasn't expected, but he came in. He'd had a few and when he saw the Kid a nasty look came into his eyes.

"Hello, you little son-of-"

"Wait a minute, Big Boy," drawled the Kid. "Don't call me that. Us southern fellows only use that particular cuss word in so-called funny stories, or when we're hankering for a nice big fight."

"Fight, hell," snarled the Big Boy. "Why, Kid, I can break you with two fingers of my left hand."

"Fair enough," said the Kid very quietly, "but I've warned you."

Nothing else was said, the tension passed and the B.B. edged into the circle around the table, but on the opposite side from the Kid. Presently the dice got around to him. Looking at the Kid as if to nag him on, he said—

"I'll shoot five bucks."

Nobody said a word. Our speed that night was about a quarter.

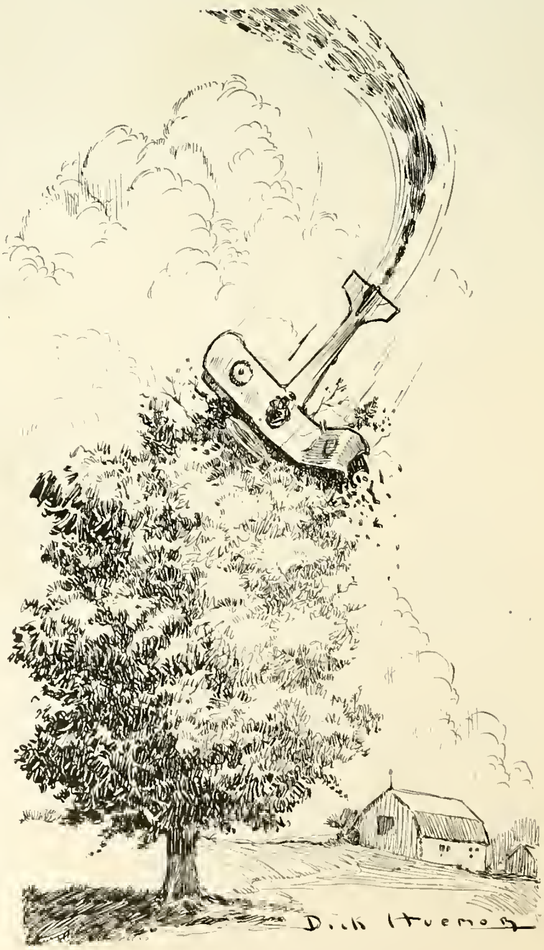
"What's 'a matter," snarled the Big Boy, "are you pikers broke?" Again he looked at the Kid, who then dug down into his pocket and pulled out four one-dollar bills. There was a dollar on the table in front of me. As the Kid reached for it, I nodded.

"Ain't there any he-sports in this crowd of cheap skates," said the Big Boy, again right at the Kid. "I'm shooting five bucks."

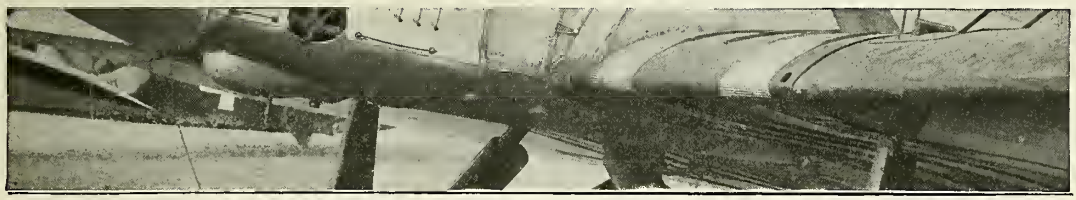
"You're faded," said the Kid as he threw down his five ones.

"Y'don't say," came back the Big Boy. "Well, I don't shoot craps with no little southern son-of-"

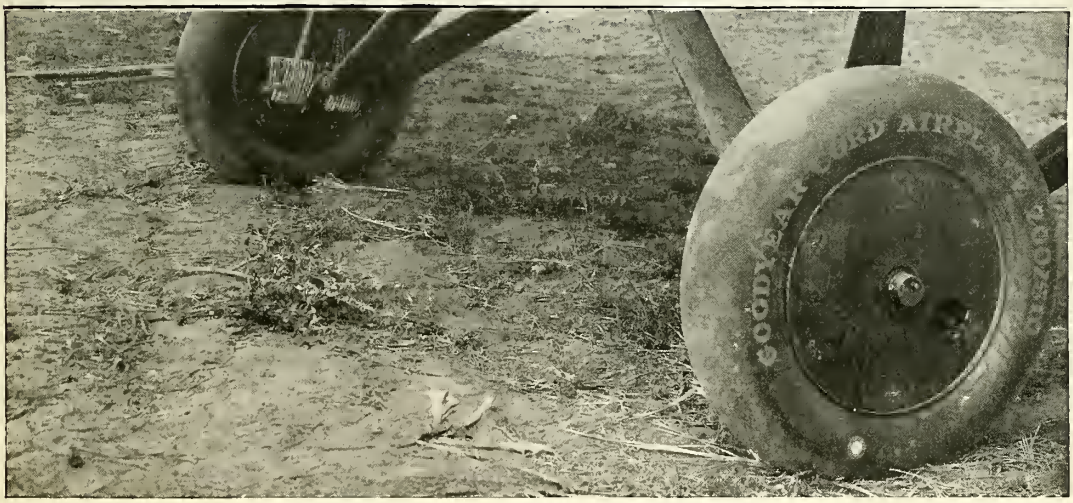
(Continued on page 251)



"Always pick out a nice, big, live oak tree to fall in."



TO HELP YOU DOWN AND UP AGAIN



IMAGINE—dropping an automobile on two wheels! Yet airplane tires take that, perhaps many times a day. Even a perfect 3-point landing gives the tires two-thirds of the job, and more than that when the eye is bad or the field worse.

So, from the word "Contact" back to the hangar you must have tires that will help you down and then help you up again. Goodyear Airplane Tires do both. They roll easily and smoothly over soft or lumpy ground. And they'll be sound and buoyant when you level out for the finish.

Goodyear Airplane Tires are made to fit the weight and character of the ship; to stand the gaff of "Emergency Fields" and be ready for work in the morning.

The very best materials, and an experience older than aviation, go into every Goodyear Airplane Tire. And into every other airplane part that Goodyear makes.

Aeronautics Department
THE GOODYEAR TIRE AND RUBBER COMPANY, INC., AKRON, OHIO

GOODYEAR

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AIRPLANE TIRES

THE HEATH PARASOL SPORT PLANE

By
George F. McLaughlin

AFTER their extensive experience in building many successful types of light sport planes, the Heath Company is producing a new low-powered monoplane embodying practical features appealing to the average flying enthusiast. The purpose was to produce a sturdy low-cost plane requiring only ordinary skill to fly and maintain. Safety, of course, is given prime consideration and both aerodynamically and structurally the Heath Parasol conforms to approved standards. Due to its inherent stability and light weight the plane should be easily handled by a person with comparatively limited experience and instruction in flying.

Realizing that in order to make a sport plane popular first cost must be really low, the designers have succeeded in simplifying the details to such an extent that the cost has been brought within reach of those who can afford a low priced automobile. The engine used, the Henderson 4-cylinder air cooled vertical type motorcycle engine, is a convenient and economical power plant.

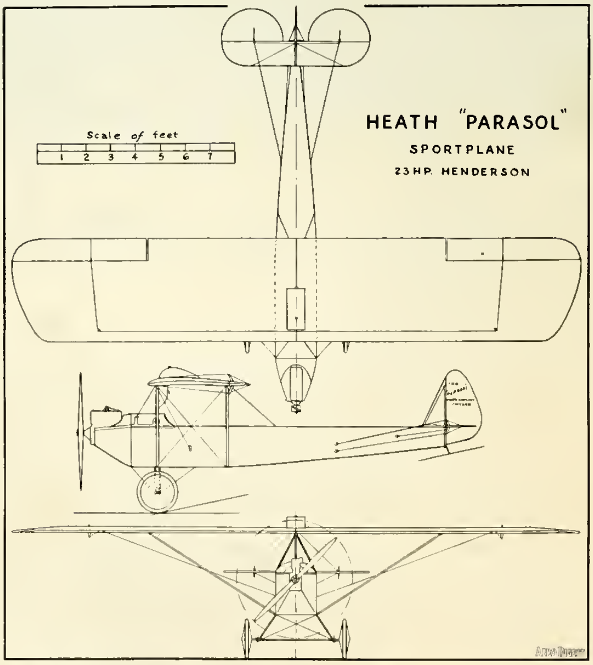
Steel tube is used for the entire fuselage structure, with fittings and wires but no welded joints. Light steel tubes support the engine which is mounted on ash bearers. On either side of the fuselage steel tube struts, with diagonal wire bracing between, support the wing. Inverted V struts above the body support the wing and a 3.3-gallon fuel tank above the cockpit.

The steel tube landing gear is of extremely simple construction, light in weight but rigid and strong. Wheels are 20 by 2 inches, carried on a one inch axle. The tail skid is a flexible steel spring.

Wings are of conventional type, built up with spruce I beams with spruce rib webs and cap strips. The two panels are joined together at the center, with a built-in gravity fuel tank. Tail surfaces are also of conventional structure built up with a light spruce framework.

Any light engine from 20 to 30 h.p. may be used, but as standard equipment the Henderson motorcycle engine has been selected as being the most inexpensive, efficient and reliable. A special propeller conversion has been devised by Heath. For taking off, the engine may be run up so as to develop 23 h.p. but as for normal flight less power is required, the engine may be throttled down when once in the air.

General specifications and performances of the Heath Parasol monoplane: Span, 23 feet; chord, 4 feet 4 inches; wing area, 94 square feet; angle of incidence, 3 degrees; length overall, 16 feet 9 inches; height overall, 5 feet 10 inches. Weight, empty, 290 pounds; useful load, 225 pounds. Speed range, 32 to 70 m.p.h. Cruising radius, 140 miles.



Powered with a Henderson motorcycle engine, the Heath sport plane presents a real business-like appearance.

On into the 9th Year—

A Wonderful Recommendation!

LEARN TO FLY—$100

NO BOND REQUIRED
NO CHARGE FOR BREAKAGE

EXPERIENCED INSTRUCTORS
BEST OF EQUIPMENT

EIGHT YEARS WITHOUT AN ACCIDENT

NEW STANDARD J-1 AIRPLANES

SET UP, TEST FLOWN, READY TO FLY AWAY—COME AND TAKE YOUR PICK
WITH OX5, $900—WITH HISPANO SUIZA, $1500

ROBERTSON AVIATION SCHOOL

Write for free catalogue.

Lambert—St Louis Airport, Anglum, Mo.

WESTERN NEWS

BOEING GETS WESTERN AIR MAIL CONTRACT

THE Boeing Airplane Company was awarded the contract for carrying mail by air on the western section of the government-operated route — Chicago-San Francisco. Their bid was $1.50 per pound for the first 1,000 miles and 15c a pound for each additional 100 miles. The route is 1,906 miles long.

The executive offices of the company will be in Seattle and the operating headquarters will be in Salt Lake City. Edward Hubbard will be the operating manager of the line with headquarters in Salt Lake City. Mr. Hubbard flew the oldest established contract lines operated under the Post Office Department, between Seattle, Washington, and Victoria, B. C.

There are under construction at the present time 25 planes especially designed for this work. They will be powered with Pratt & Whitney "Wasp" engines. They will be biplanes with tubular steel fuselages having a carrying capacity of 1,800 pounds pay load. To begin with arrangements will be such as to provide for the carrying of two passengers and 1,500 pounds of express and mail. If traffic warrants the number of passengers carried can be increased to four with a consequent reduction in the express and mail. It is anticipated that the first airplane will be ready for flight by May 1, and that the entire quantity of twenty-five will be flying by June 15.

OAKLAND AIR FIELD

THE City of Oakland has purchased a 680-acre site on Bay Farm Island for a flying field. It is a natural field 17 minutes from Portland with all four sides clear and no wires to interfere bordering the Alameda Bay where there is plenty of water and room for seaplanes and seaplane hangars. Work will start on this field this month. The field is clear of fog all year round.

Wide World Photo.

Gov. Hartley greets Gene Tunney on his arrival by plane at Olympia, Wash.

The first commercial aviation company to start operations on this field was the Royle Rose Airlines, the Swallow agents for this territory, which started last November. Royle-Rose Airlines is composed of Capt. W. H. Royle, A.C.R., Lieut. Franklin Rose, A.C.R., with Capt. D. E. Doty as chief instructor. They have offices at 324 13th Street, Oakland, and at the field. They are connected with the Aerial Surveys of California, managed by W. Fraley, who has taken hundreds of photos of the East Bay in their ships. Capt. E. Cavagenro, A.C.R., is assistant office manager and advertising and conducts a bureau of information on aeronautics.

They also have a class of 10 students taking the full course of flying instructions; carrying passengers to any part of the U. S.; and make advertising flights.

THE PROFESSIONAL PILOTS' ASSOCIATION

By Boyd M. Shelton, President

ON the second Tuesday of February, the Professional Pilots' Association held their forty-third regular monthly meeting, with an almost one hundred per cent attendance of members present in Southern California. As all members of this association are earning all or a portion of their livelihood from commercial aviation, the percentage of membership attending regular meetings is exceptionally high. At this meeting, the new federal regulations were discussed and application forms were furnished its members. The association will also furnish, upon request, registration blanks to any operator or pilot.

Three years and seven months ago this association was organized. During this time, with the exception of one accident resulting from the testing of an experimental monoplane, there has not been a single fatal accident to any of its members, and never a passenger injured by any pilot of the association. Although the figures are not complete, records already on file show an excess of 46,800 hours flown and 3,465,000 miles.

For the past three years the association has had an Engineering Board, composed of three competent engineers selected from its membership, and have offered free inspection of all ships owned or flown by members.

This association welcomes all commercial pilots who have established good records and have flown for more than four years. It is their intention to grant charters as soon as enough applicants to form a chapter in any vicinity are elected to membership, and in so doing expand to a national organization.

The association wishes at this time to congratulate Secretary MacCracken on presenting the aircraft regulations so fairly and thoroughly and to offer him its complete cooperation in any matters within its power.

Airviews of Oakland, California, and the site of the new municipal airport, 17 minutes from the city.

To the Services
Leadership and Progress
SIGNIFY

DOUGLAS

In 1924—Douglas Airplanes Delivered the Nation's Message Round the World.

Today — Fifty-Eight Douglas Airplanes are Delivering the Nation's Air Mail and More than a hundred Douglas Airplanes are in Service with the Nation's Air Corps.

And Now—

The Improved Air Corps Douglas Observation for 1927

THE DOUGLAS COMPANY
Santa Monica
California

THE HOLLYWOOD AERO CLUB JUBILEE FLIGHT

By Lieut. Earl T. Vance

THE Hollywood Aero Club, sponsoring the International Aviation Peace Jubilee to be held in California from July 2-9, have invited aviators from all countries in the world to California for the event.

The club is now engaged in working out the details of the program for the Jubilee and will announce same at a later date. The publicity campaign was launched the first week in January with my flight in a Waco 9 from Sidney, Mont., to El Paso, Texas and west through Arizona and Southern California, displaying a sign on the lower wings "Hollywood Aero Club" with information on the fuselage regarding the Jubilee.

Sidney, Mont., is located in the fertile irrigated valley of the lower Yellowstone River, within 25 miles from where it joins the Missouri near old Fort Union and Fort Buford of Indian days. From the air the country resembled a great waste of snow and ice. Leaving Sidney on the afternoon of January 2nd, I followed the general course of the Yellowstone River, cutting off the curves around which once so slowly paddled the canoes bearing Lewis and Clark on their explorations; around which river steamboats later labored upstream against the current on the June rise taking supplies to traders and soldiers at Miles City, and carrying downstream the furs and hides of a year's trapping and buffalo-shooting. In flying over such territory, one realizes the vivid contrast between the slow, laborious transportation of those days and the present day air transport—all in the short space of one life time.

In passing over Glendive, where the Northern Pacific strikes the Yellowstone from the east, one can look eastward across the rough lands of Western Dakota which Roosevelt loved and in which his ranch was located. Further up the Yellowstone, one passes the mouth of the Powder River, from which originated the famous war-cry "Powder River" used by the World War soldiers from Montana and Wyoming. The source of this river is in the Tea-Pot Dome district of Wyoming. We continue up the Yellowstone to Miles City where the Tongue River comes in from the south. Near the mouth of the Tongue one can still see excavations made by General Miles' soldiers for use as rifle pits and for powder storage. Miles City is of interest as once being the greatest wild-horse trading center in the world. It has always been a rendezvous for cowboys and cattlemen. From here we fly southward up the Tongue River and soon enter the country to the east of Custer's Battlefield. It was here near the top of a hill that Custer and his remaining handful of men made their famous "last stand."

We fly on southward, as the afternoon shadows of Bighorn Mountains grow long, across northern Wyoming's short-grass country until darkness forces us down on one of the hill tops of the Salt Creek oil fields, or Tea-Pot Dome. Here we pass the night. In flying over such a field one gets it all, vast as it is, in one glimpse, and is astounded at the apparent outlay of money, in the thousands of derricks, pumps, storage tanks and the many towns.

We fly to Casper and are out of the snow, though in a high country, about a mile above sea level, and subject to snowstorms at any time, so we continue our journey after a short rest at the Powder River Flying Club. Following around the mountains eastward from Casper we pass over the country which was crossed by the "covered wagons" westward bound along the Oregon Trail. One can look a few miles over into mountains and see much territory not even yet trod upon by white man.

Now we are west of the high range which lies west of Denver, and we see the many high peaks around 14,000 feet elevation, the best known of which is Pike's Peak.

All this time we are flying over country which is generally believed to be cold and covered with snow the entire winter, but our thermometer never registered below freezing in flight on the entire trip, and there was not one uncomfortable moment from cold. We land at Denver, the great mountain metropolis, with its industries and modern commercial life in striking contrast to the territory we just flew over.

Continuing southward, we find at Colorado Springs a comparatively smaller town and health resort, a large flying field, one mile square, surrounded by miles of open flat country.

Further south we find a good airport at Pueblo, with hangar and a club house being erected where aerial travelers can obtain shelter and food, where communities can hold social functions, as is done at present in golf and country clubs. So here is a new use for municipal flying fields—that of helping care of recreational needs.

On and on southward we fly, bucking the steady southwestern winds which prevail in this country. Across the "Divide," near Trinidad, which we have been warned is bad flying, only to find that from about 10,000 feet altitude one can reach a safe landing at any time in crossing, and on top of the highest part of the Great Divide are hundreds of acres of open spaces where one could land. Once across Raton Pass we find rolling grazing lands.

At Las Vegas, N. M., we land, instead of our scheduled stop at Santa Fe because of snowstorms in the mountains over which we would have to fly to reach Santa Fe. So we stay east of the mountains and move on southward over the colorful broken land of New Mexico, partly covered with scrub timber and largely open grazing country with often no place of habitation visible for from 20 to 50 miles, which would mean a long walk without food and water in case of motor trouble. But we seldom made such trips without some provisions such as chocolate bars and we can always drink our radiator water as a last resort. We pass Carrizozo and look over the lava beds to the west.

We now come to El Paso, Texas—"The Pass"—said to be the only water pass through the American Rockies. El Paso is known to many as the town across the border from Juarez—a Mexican town to which one may go for six cents carfare; and a place where Volstead must be highly honored, as Juarez is kept very, very busy serving thirsty persons, mostly from the States, and reaping a golden harvest therefrom. The Rio Grande shows up from above as a small creek, much to our disappointment, as we expected to see a "River Grand." The difference between El Paso and Juarez is marked—Juarez with its old long low rambling masonry structures with patios in the center, whereas El Paso is an up-to-date city.

Our next hop is over the semi-arid lands of southern New Mexico and Arizona, with its cactus, sage brush and a few low mountains to Tuscon, where again we find a thriving little city. From Tuscon west to Yuma we find a gradual fall in ground elevation to a little over 100 feet.

West of Yuma we cross a lot of sand dunes which would be fine places for children to play but bad places in which to land an airplane. These piles of sand must reach one hundred feet or more elevation and apparently shift about with the strong winds. Next Imperial Valley, the valley below the sea level, part of which has been converted into a vast garden by irrigation from the Colorado River.

Hughes Photo.

Hollywood Aero Club officers: Rob't Barlow, Chairman of Finance Com.; Burr McIntosh, Chairman Publicity; Roger Adams, pres.; J. H. Fieldhouse, sec'y.

At the end of Imperial Valley we find Cajon Pass, between the San Gabriel and the San Bernardino Mountains of the Coast Range, which rise on each side of the Pass to near 10,000 feet, with the snow-capped peak of "Old Baldy" looking down at us from the north and the clear waters of Lake Arrowhead sparkling in the bright sunshine from its lofty basin on the south.

Swiftly we fly through the Pass, at an elevation of 5,000 feet, and suddenly there appears before us the broad golden fruited San Bernardino Valley in a panorama as far as the eye can reach—Riverside with its Mission old and gray beside Mt. Ribidoux—acres of orchards and pretty homes—a veritable sea of small towns. A beautiful sight in the clear morning—the mountains behind, the coastal plains, Los Angeles ahead, Hollywood with its beautiful homes, and beyond the Pacific Ocean. Far to the south lies Los Angeles harbor dotted with warships, ocean liners, and fishing boats, and on its shore Long Beach and Wilmington.

Now we shut down our motor, and make a long smooth glide into Clover Field at Santa Monica and our journey is ended.

ARCADIA NEWS

THE firm of McDaneld and Shelton, aircraft operators, is located at Arcadia, Calif. Their flying equipment consists of one DH4B equipped with a high compression Liberty, one Romair equipped with a Model E Hisso, and one Hisso Jennie. During 1926 this organization flew a total of 340 hours or 26,000 miles. One hundred and twenty hours was flown for the Western Branch of Fairchild Aerial Surveys, Inc., during which time over a million acres were mapped in California and Sonora, Mexico.

The year of 1927 has started out in grand style—to date three small maps have been completed, over fifteen students are enrolled for instruction, and preparations are being made to start soon on a fifty-hour mapping job for the Fairchild organization.

The personnel of this firm consists of D. E. McDaneld, Pasadena Packard Distributor, and Boyd M. Shelton, veteran commercial pilot and president of the Professional Pilots' Ass'n, in charge of operations.

Paul Richter, Jack Frye, Frank Samuels and Montee Edwards loading the Eaglerock with copies of Aero Digest for the first delivery of magazines via parachute.

DELIVERING MAGAZINES BY PARACHUTE

JACK FRYE of the Aero Corp. of Calif., witnessed by a number of newspaper men, proved the practicability of delivering magazines or other light express matter by plane and parachute.

The first test was made at the Aero Corp. field on Western Avenue, dropping a package of twenty-five copies of AERO DIGEST within ten feet of the designated spot. This is believed to be the first delivery of magazines by parachute. He then flew low over the Warren School of Aeronautics and dropped another package of twenty-five.

LIGHT YOUR AIRPORT
with a
SPERRY BEACON

LIGHTEST because it is made of a special corrosion resisting aluminum alloy and consequently weighs only 150 lbs.

BRIGHTEST because the finely ground glass reflecting mirror is properly supported to prevent distortion.

BEST because it is designed and built by the World's leading manufacturer of High Powered Searchlights.

Ninety of these beacons with automatic lamp changers are now being supplied to the Department of Commerce for illuminating the Country's principal Airways.

SPERRY

THE SPERRY GYROSCOPE COMPANY
MANHATTAN BRIDGE PLAZA, BROOKLYN, NEW YORK
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FLYING OVER NATURE'S WONDERLAND

By Tex Rankin

HERE in the Northwest we have many problems to deal with in the flying game that those of you in the Middle States do not have to worry about. For instance we have the timber, mountains, fog (in the winter), lack of landing fields and the scarcity of population.

I have flown over virgin spruce timber along the Coast Range that had the appearance of a green velvet carpet stretched over the mountains from the Willamette Valley, thirty miles east of Portland, Oregon, to the blue waters of the Pacific, twenty miles west of us, making aerial maps. The region is dotted with beautiful emerald lakes that would make the Lakes of Killarney look like mud holes in comparison. One could make a "pan-cake" landing in one of these lakes very easily with a land plane, the greatest danger would be from starvation and exposure after one landed, as the country is practically uninhabited. However we use a Waco with the old faithful OX5 motor for such trips, so we never have to worry. (Advertisement—as Cy Caldwell would say.)

The Cascade Mountain Range, on the east side of the Willamette Valley, is very interesting to fly over. This range is somewhat higher, a great deal more rugged than the Coast Range. It is also dotted with beautiful green lakes, but the timber is not as thick. On the western slope most of the timber is Douglas fir; on the Eastern slope, mostly white pine. The Cascade Range is famous for its beautiful snow-covered peaks —Mt. Ranier, Mt. Adams, Mt. St. Helens, Mt. Hood, Mt. Jefferson and the Three Sisters, all of which are plainly visible from an airplane three thousand feet above Portland. Rainier, St. Helens, Adams and Hood are visible on the ground at Portland.

Twenty-five miles east of Portland lies the unsurpassed scenic wonder—the Columbia Gorge. It is the water grade outlet from the West Coast to the East. Flying through this great masterpiece of nature, an airplane need only be two hundred feet above sea level to cross the Cascade Range. This gorge has made it possible for the writer to cross the mountains many times in the past seven years when fog was so bad that it would have been impossible to have flown over the mountains.

The Northwest has many potential airways, the most logical of which is from Portland through the Columbia Gorge to Pendleton, Oregon, then across the Blue Mountain Range to La Grande, in the Grande Ronde Valley, to Baker and then to Huntington, Oregon. Here we cross the Snake River into Idaho, passing over Weiser to Boise, the capitol. From Boise the route leads across the desert over Mountain Home, Glens Ferry, and on to Pocatello. From here one can go either to Salt Lake City to the south or continue east along the Oregon Short Line Railway until the transcontinental air mail line is reached at Rock Springs, Wyoming.

This route is much better than the route through Spokane and Montana due to the fact that it is necessary for a plane to go up about 10,000 feet across the Bitter Root Mountains in northern Idaho and Montana. There are many miles of timber between Coeur D'Alene, Idaho and Plains, Montana. From Missoula east there is also a bad stretch of mountains. After crossing the Missouri River in Montana, however, the flying is absolutely safe.

We have two potential routes to the south, one a natural winter route and the other a summer route. The summer route extends from Blaine, Washington, on the Canadian boundary line to San Diego, California, near the Mexican border. This route leads through Seattle, Tacoma, Centralia, Kelso, Washington, Portland, Salem, Eugene, Roseburg, Grants Pass, Medford, Oregon and Redding, Red Bluff, San Francisco, Bakersfield, Los Angeles and San Diego.

The winter route is through the Columbia Gorge from Portland to The Dalles, Oregon, then south to Bend and southeast to Lakeview, Oregon on the California line. From Lakeview the route leads over Alturis and Susanville, California, to Reno, Nevada. From Reno one can cross the Sierra Mountains to Frisco, Oakland or Sacramento, California, or continue on south over the Nevada deserts through Yerington, Tonopah, Goldfield, Nevada, Death Valley Junction, California, then to Las Vegas, Nevada, where the Salt Lake-Los Angeles air mail airway crosses. Here one may follow the air mail route into Los Angeles or Salt Lake, or if one is going to Arizona the route continues south through Search Light, Nevada, a mining camp with no landing field, then south by southeast to Kingman, Arizona, across the Colorado River. Kingman has a splendid field, two miles east of town. From Kingman one can go east over the Tri-State Airway through Seligman, Williams, Winslow, Holbrook, Arizona and on through northern New Mexico into Colorado and Kansas. All of the towns named above have good fields, however it is not advisable to land at Williams, Arizona, in the winter time or when a hard wind is blowing, and due to its high elevation (6,800 feet) do not land there with an under-powered plane.

If one wishes to go to Phoenix or the southern part of Arizona this can best be done by going south from Kingman, down the Colorado River until the first railroad is picked up and turning east along this railway to Phoenix. This affords a splendid route to Texas and the southern part of the United States.

The only trouble with the winter route over the deserts is the high elevation, averaging about 5,000 feet. There are no section lines to follow so one needs a good compass. One also needs a large gas tank of four to five hours capacity, as the towns are few and far between. Water and emergency rations, a small axe to cut sage brush for fuel and plenty of matches should be carried. On this route one can fly from Mexico to Portland, Oregon, without passing over any timbered areas. A landing can be made at almost any of the little towns.

I have flown over all of these routes, both in the winter and the summer. The summer route is not advisable in the winter on account of fog, rain and wind-storms coming up out of the Pacific almost without warning. The winter route should not be taken in the summer on account of the extremely hot and bumpy air. As a matter of fact it is practically impossible to fly over this route during the middle of the day.

Due to the large amount of water in the Northwest our country should prove a good market for amphibians, providing some good reliable ship of this type could be put out at a reasonable price.

The Port of Portland is now spending one million dollars on what we believe will be, when completed, the finest airport in the West. This airport will be ready for use some time this summer.

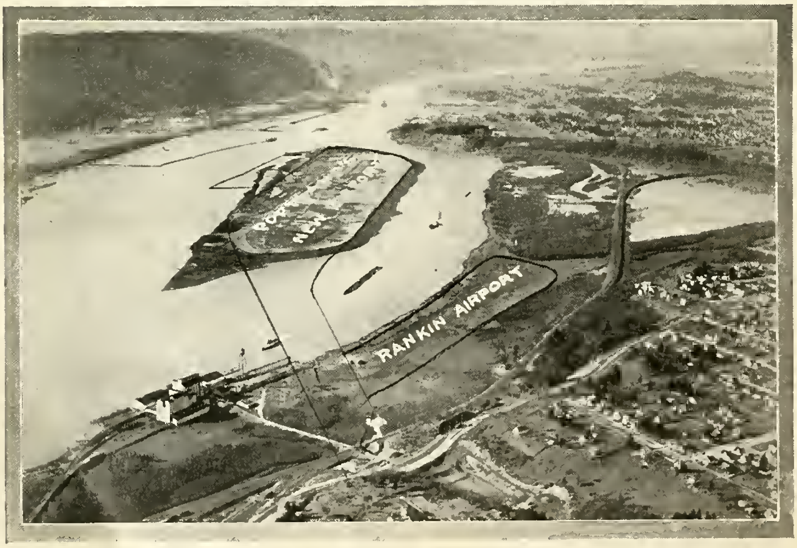
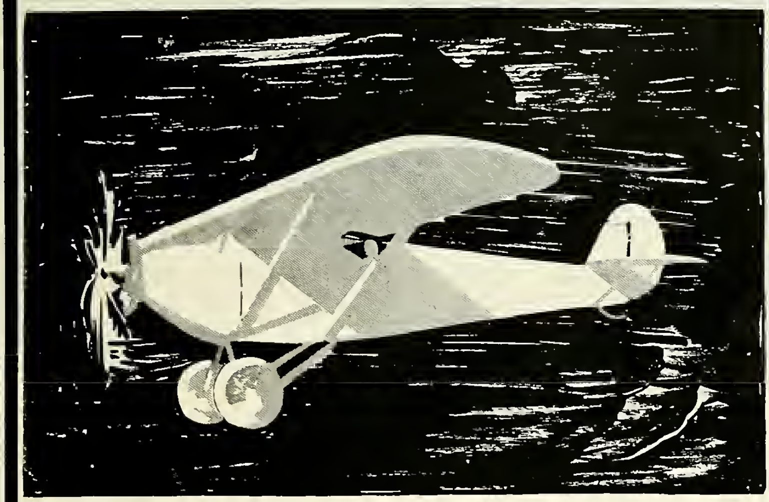


Photo by Brubaker Aerial Surveys.

Portland's new million dollar airport, showing line of fill to be made; to be completed for use during this summer. Rankin Airport is outlined in the foreground.



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"The plane that pays a profit"

RYAN AIRLINES, INC.
San Diego, California

AL ESSIG

Commander Richard Byrd is Oregon Aero Club's first life member.
Left to right: L. L. Adcox, pres., Oregon Aero Club; Comdr. Byrd; Don S. Phillips, Sec'y, Oregon Aero Club; Acting Mayor of Portland, C. A. Bigelow; Fire Chief Lee Holden; Lt. Comdr. P. W. Northcroft, and Chief of Police Leon Jenkins.

SAN FRANCISCO'S AIRPORT SOON AVAILABLE

By Capen A. Fleming
Manager, Industrial Department,
San Francisco Chamber of Commerce

PROCEEDING with full knowledge that the West Coast embraces all factors to make it the natural center of the aircraft industry, the San Francisco Chamber of Commerce started a movement for an airport in August, 1925. Both the educational and engineering work incident to securing this have been continued since that date.

San Francisco has within the city limits, Crissy Field, which is the Army flying field, but due to topographical and air conditions, there seems to be no place within the city limits where a proper airport can be laid out. Since we believe that aircraft industry will desire to locate around such a port, this makes it important that the port should be situated where industry can locate.

The Chamber of Commerce Aerial Affairs Committee is made up of representatives of the Army, the Navy, commercial aviation, and civilian flyers. A very careful study, both on the ground and from the air, has been made of available sites as far south of San Francisco as Redwood City. This study has shown that there is a considerable number of available locations. The Chamber of Commerce found a spirit of coöperation among members of the Board of Supervisors of the City and County of San Francisco, who compiled with the request of the Chamber and incorporated $100,000 in the 1926-27 budget to be applied on the purchase of an airport.

An amendment to the Charter of the City and County of San Francisco was presented by the Board of Supervisors to the people at the fall election, permitting expenditure of public moneys outside of the City and County of San Francisco for the purchase of an airport, and this was passed by a large majority.

All that remains to be done now is to select some one of the several suggested sites, but since there has been disagreement as to the air conditions that prevail on these various sites, the Chamber of Commerce has recommended the acquisition of a temporary site at South San Francisco, together with the appropriation of $7,500 to provide a daily study of weather conditions by the U. S. Weather Bureau on certain specified sites which the Board of Supervisors might designate as suitable for acquisition for permanent airport purposes. Up to the present, a definite decision has not been made in regard to this recommendation, although it was received favorably and is expected to be adopted very shortly.

On such temporary site, hangars and other improvements will be constructed of such nature as will be movable to a permanent site without any appreciable loss of money.

San Franciscans fully appreciate the need of an airport, both from a commercial and industrial standpoint, and it will be only a few months before at least a temporary airport will be available.

NEW INTERNATIONAL AIRCRAFT PLANT

WITH distributors and dealers in practically every state and in several of the foreign countries, the demand for International Aircraft planes has increased at such a rapid rate during the past six months that the company has been forced to move its plant from Santa Monica to larger quarters in Long Beach, Calif. The new plant is housed in a building of 15,000 square feet of working capacity.

Quantity production is now under way on a complete line of planes. One of the models will be a three-place sport plane built in such a way that it is virtually capable of flying itself. During recent tests, pilot Frank Clark while flying alone left the cockpit, climbed around the wings and leisurely returned to his seat. During all of this time the plane flew itself without any devices being used to hold the controls.

The second type of plane being built by the company is a five-place combination commercial and mail plane.

The third, and most interesting, plane being manufactured is a giant 22-passenger, three-motored, cabin airliner. It is beautifully finished and fully appointed, including a buffet kitchen. For night flying the interior can be converted into sleeping compartments for 15 passengers.

NORTHWEST NEWS

By F. K. Haskell

APPRECIATION of the work being done by the Aero Club of Oregon to foster commercial aviation and especially in its efforts to sponsor landing fields in the various cities and towns of Oregon, was expressed by Commander Byrd at Rankin field when he was presented with a gold honorary life membership by the officers of the club.

At the first annual meeting of the Pacific Air Transport Company held at Portland, Oregon, recently, practically the same officers were elected for the ensuing year. C. N. Comstock, vice-president, reports that a number of notable flying records have been hung up during February including that of Aviator Cunningham who flew from Medford to Portland in 1 hour and 50 minutes He made the 250 miles at about 170 miles per hour, and was not aided by favorable winds. Heavy loads are now being carried both north and south over the Coast route, the average recently being 125 pounds carried south, and 148 pounds north. Twelve planes make up the PAT company's fleet, eight of which are in daily use. N. B. Evans, traffic manager, reports that there has been a decided increase in the number of passengers handled over the line during the first two weeks of February.

A landing field has been secured at Pendleton, Oregon. A tract of 120 acres three miles east of the city has been leased for a period of five years.

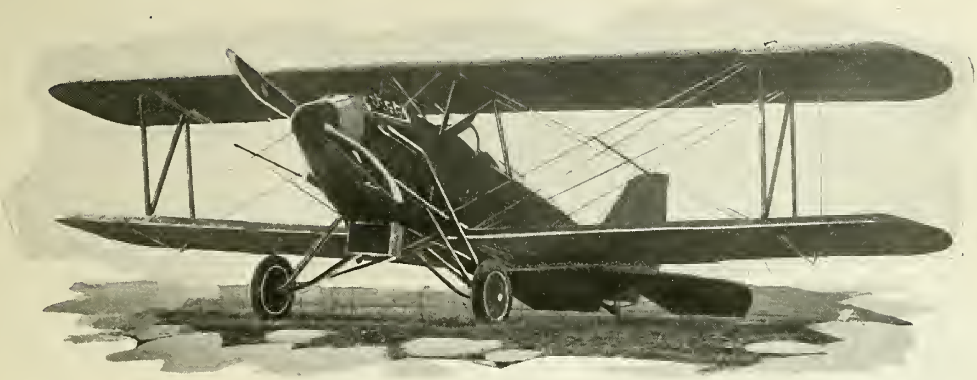
North Pole flights virtually have "made" commercial aviation in Alaska and, while there are not quite as many planes there as have humorously been pictured, the business of flying is well advanced according to R. H. Merrill of Portland, and who has recently departed for the northern territory to pilot commercial planes. Alaska now has 29 air fields, and airplane service of considerable importance, according to a report of the Alaska Chamber of Commerce. Two companies operate planes out of Fairbanks, now serving all points in the interior and northwest.

NEW KINNER AIRSTER DELIVERS AERO DIGEST

By Frank E. Samuels

THROUGH the courtesy of the Kinner Airplane and Motor Corp. of Glendale, Calif., and with Mr. Kinner flying the little ship, the February issue of Aero Digest was delivered to all the fields of Southern California in just five hours. Mr. Kinner, being desirous of giving his new five-cylinder, radial air-cooled 100 h.p. motor a hard and thorough tryout, made arrangements with the Aero Corp. of Calif. who have just signed a contract to deliver the magazine for one year to all of the flying fields of Southern Calif. from Ventura to San Diego, to take their place for this one delivery.

During the entire trip the motor never missed a stroke and the many stops did not affect it in any way, the little ship making quick take-offs and perfect landings.



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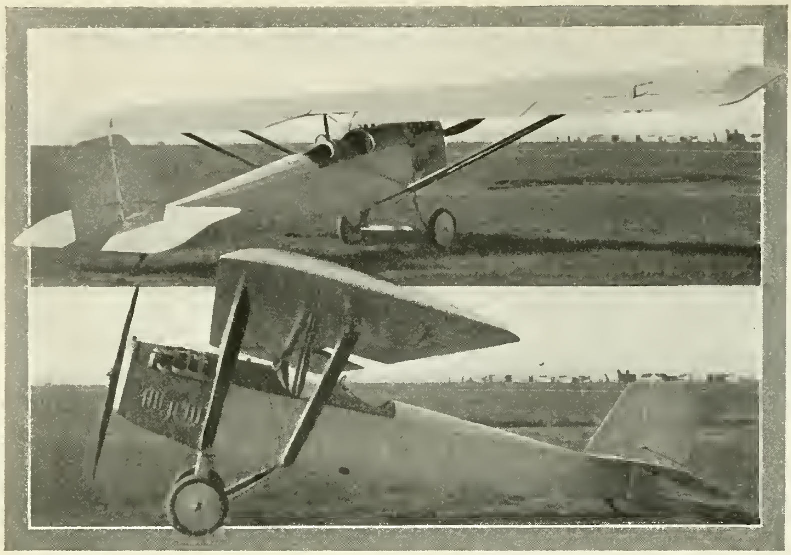

The Brown OX5-engined parasol monoplane which has a speed of 110 m.p.h.

SAN DIEGO'S CONQUEST OF THE AIR

By Major T. C. Macaulay

Chairman Aviation Section, San Diego Chamber of Commerce

UNDOUBTEDLY the first step in the development of commercial aviation in a city is to provide facilities. The San Diego Chamber of Commerce has had for several years an aviation committee, formed originally to cooperate with the army and navy aviation units located in this city, and subsequently to develop the commercial aspects of flying. Two years ago San Diego was formulating a city plan under the leadership of John Nolen of Boston, Massachusetts. The aviation committee of the Chamber of Commerce requested him to include a reservation for a municipal airport in his plan, and upon the advice of the committee a section of the tide lands bordering on San Diego's bay was reserved, and the airport was officially recognized with the adoption of the Nolen plan by the city.

When the aviation committee was organized, it had three major objectives—

First, the establishment of a municipal landing field, a terminal for passenger and mail planes and a landing place and depot for private planes.

Second, the framing of a suitable ordinance to be placed on the statute books of the municipality, which would not only protect the lives and property of our citizens from the hazards attendant upon low flying and unsafe flying, but would provide for proper inspection of machines; provide also for licensing of competent pilots, and serve to encourage commercial aviation by throwing around it safe and sane restrictions.

Third, to make every effort toward the establishment of air mail and commercial routes from San Diego north and east.

All of these objectives have been accomplished. The municipal airport is on its way to completion; an ordinance is upon the statute books and an active board of air control governing the flying over the city, licensing of pilots and inspection of planes. An air line is operating between San Diego and Los Angeles, where it connects with the Western Air Express and Pacific Air Transport lines; and within the last month an air line has been established between San Diego and Phoenix, Arizona.

The San Diego Chamber of Commerce was probably the first Chamber of Commerce to have an aeronautical engineer on its staff of executive secretaries. So important has the development of commercial aviation become in San Diego within this last year that Mr. George Prudden, formerly technician for the Stout-Metal Airplane people, has been retained as aeronautical engineer.

A sub-committee composed of Captain H. Stafford Doyle, Commandant of the Naval Air Station, Mr. Prudden and Frank Page, are working in conjunction with the California Development Association, the State Chamber of Commerce, in the development of state-wide aviation.

Finally, as a result of the ground work that has been done to prepare the way for commercial aviators in San Diego, the aviation section, which is a branch of the industrial department of the Chamber of Commerce, is turning its attention to the development of local aircraft industries. San Diego is proud of the Ryan Aircraft Company which has been building the famous Ryan M-1 for more than a year, and will soon add an all-metal airplane factory to its aviation industries, under the management of Mr. Prudden.

I have not tried to set the San Diego Chamber of Commerce up as a model in this article, but I have endeavored to show what San Diego has done toward the development of commercial aviation, and how she is going about it, with the hope that it may be of value to other civic organizations who are alert to the industry that Ted Jordon of the Jordan Motor Company recently told a gathering of California aviators "would make the automobile business look like a small-town piker."

BROWN MONOPLANE

THE Brown parasol type monoplane is a three-seater for commercial or pleasure, designed and built by Lawrence W. Brown of Los Angeles, California. It is of the rigidly braced high wing type, the general design throughout being simple and rugged. The OX5 Curtis 90 h.p. engine is used.

Particular attention has been given to visibility for both the passengers and pilot. Strength factors conform to service requirements and a load factor of eight has been carried throughout the structure.

Cockpits are large and comfortable, with plenty of leg and arm room and seats are comfortable and well upholstered.

The fuselage structure is of wood and wire construction, spruce and ash being used. The engine mount is wood and wire; it is detachable making it convenient to use other types of engines.

The landing gear is of round steel tubing with wood streamlining. The tail skid is made of ash, swiveled to relieve the torque strain on the fuselage when taxiing on a curve. Rubber shock absorbers have extreme flexibility, which relieves the fuselage shocks while taxiing over rough ground.

Wings are of conventional design, built entirely of spruce with the exception of the rib webs, which are made of bass wood. Wing beams are of the box type, with both the front and the rear beam the same size, the center of pressure being located in the center between the beams. The wing section, the Brown No. 5, is of the semi-thick type, having a very good all around performance.

Wings are braced to the fuselage by large steel struts with wood fairings and covered with cloth; these struts are of streamline form and are not designed to lift. Two large flying wires on each side are crossed between the struts. They carry the load while in flight and act as drift wires as well.

Tail surfaces are entirely of wood. The stabilizer is adjustable on the ground.

Two of these machines have been in service for three years, one being used for cotton dusting in El Salvador, Central America, during the season of 1925.

In the absence of figures on official flight tests, the manufacturer's report on performance is given:

Span	40 feet 8 inches
Chord	6 feet 7 inches
Wing area (including ailerons)	260 sq. ft.
Length over all	23 feet
Height	8 feet
Weight (dry)	1,200 pounds
Pay load	300 pounds
Wing load	7.2 pounds per square foot
Gasoline capacity	30 gallons
Maximum speed	110 miles per hour
Cruising speed at ¾ throttle	100 m.p.h.
Landing speed	38 miles per hour
Climb first minute	600 feet
Climb in ten minutes	5,000 feet
Ceiling	16,000 feet
Cruising range	400 miles

VENICE
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STEARMAN
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INC.
352 THIRD AVENUE

ANNOUNCES

a 3-place Commercial Biplane

IT is a ship without radical or experimental features yet complete with those refinements of design and construction that are the criterion of Aeronautical Progress. This plane is the latest design of Lloyd Stearman whose name speaks for itself in the field of commercial designing. During the past five years Stearman has designed and supervised the production of over a hundred successful commercial aircraft and this, his greatest achievement, is the logical result of consistent improvement.

The following features are characteristic of the general quality of the ship:—Welded seamless steel tube fuselage and empennage—hydraulic landing gear—wheel brakes that can be applied in unison or individually—Hamilton Splitless Propeller—nose radiator with shutters—demountable motor bed (permitting optional installation or quick change of any motor from 90 to 250 h.p.)—dural cockpit flooring—full line of instruments including Pioneer air speed indicator and compass—Pioneer gas strainer (drainable in flight by pilot)—adjustable pilot seat and rudder pedals—adjustable stabilizer and fin—differential ailerons—tail skid assembly removable as a unit—all landing gear and tail skid bearings lubricated by the Alemite system.—These and a host of minor refinements are *basically engineered* into the Stearman plane and are not a mere tabulation of "selling points" that have been added from time to time in an attempt to modernize an old design. The result is that this is a beautifully harmonized mechanism with perfect coordination of its units.

It is impossible to judge this plane by existing standards because in itself it is a newer and finer standard. Comparisons are inadequate. It is only through contrast that the inherent fineness of this three-place commercial airplane by Stearman can be realized.

Splendid performance is achieved by scientific design and not by the sacrifice of weight that is vital to the lasting qualities of the plane. Performance, no matter how flashy, is of little value while a ship is undergoing repairs. In a Stearman plane you purchase *unexcelled* performance — *uninterrupted* service — *unprecedented* refinement.

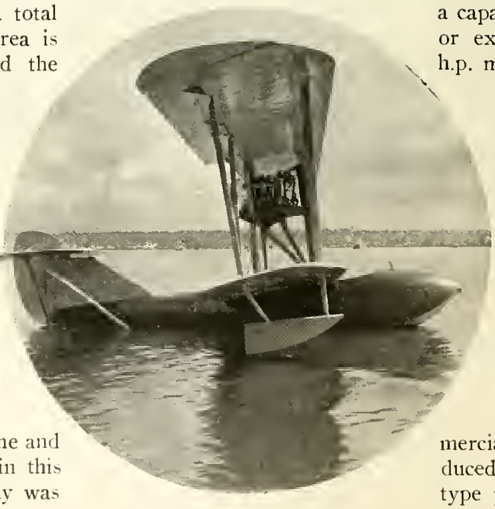
Additional details and data on request

BOEING AIRPLANE COMPANY

AT the time of its organization in July, 1916, the Boeing Airplane Company consisted of a small factory combined with a seaplane hangar; since that time the activities of the company have consistently assumed larger and larger proportions, until the plant now includes some nine buildings and employs approximately five hundred men. A total of 150,000 square feet of floor area is given over to manufacturing, and the equipment used is of the most modern type. An engineering force of fifty men is constantly engaged in developing new designs and originating improvements in detail as the science of aeronautics continues to advance.

All types of airplanes have been produced ranging from the very small fast types, weighing two to three thousand pounds, to the larger and heavier types with a total weight of fourteen tons. The Boeing Company has specialized in the pursuit type of airplane and their design has become a leader in this particular field. Since the company was organized, it has produced more than one thousand airplanes, the greater portion of these being contracted for by the Army and Navy Departments of our Government.

The commercial activities of this company date back to 1918 when they manufactured three commercial types of airplanes. One of these types was a land plane of four passenger capacity with a 200 h.p. motor; the cruising speed of this plane compared favorably with any commercial type of the same size capacity now being produced in this country. The other two airplanes constructed were flying boats of two different types; the model B-1 with either a 200 or 400 h.p. motor, had a capacity for 600 to 800 pounds of mail or express; the model BB-1 with 125 h.p. motor having a chummy cockpit arrangement accommodating three people. The performance of these planes was exceptionally good, which is borne out by the fact that Mr. Hubbard still has the B-1 flying boat in operation, carrying the foreign mails between Victoria and Seattle.

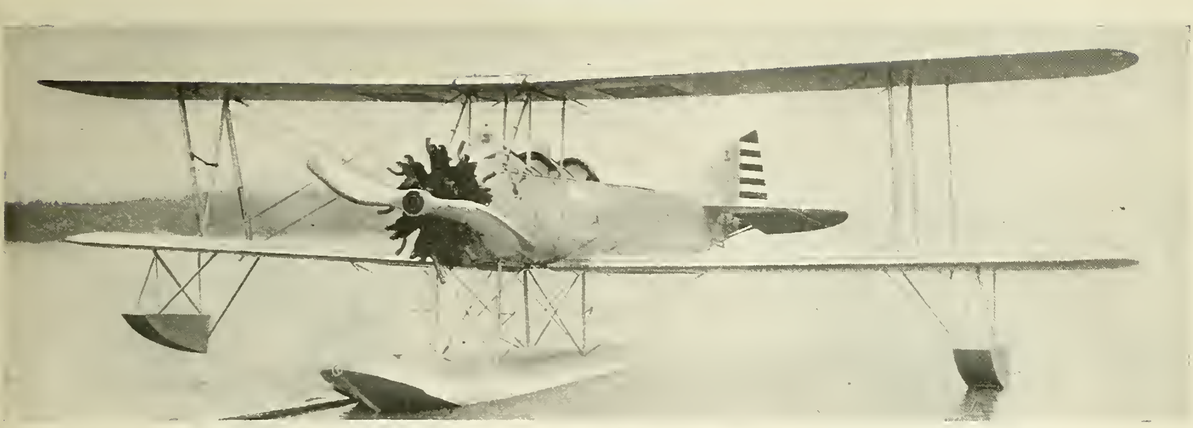


A 1918 Boeing flying boat.

After making a careful investigation into commercial enterprises, this company is developing two new types of airplanes, which it believes will more nearly meet the requirements of commercial operators than any as yet produced. These types consist of a land type passenger and an express airplane. Consideration is also being given to the manufacture of a flying boat which will be an improvement of the B-1 type airplane in constant use by Mr. Hubbard during the past seven years.

Plans are under way for the operation of a commercial air route between Seattle and Southwest Canadian ports, which will be inaugurated as soon as the airplanes

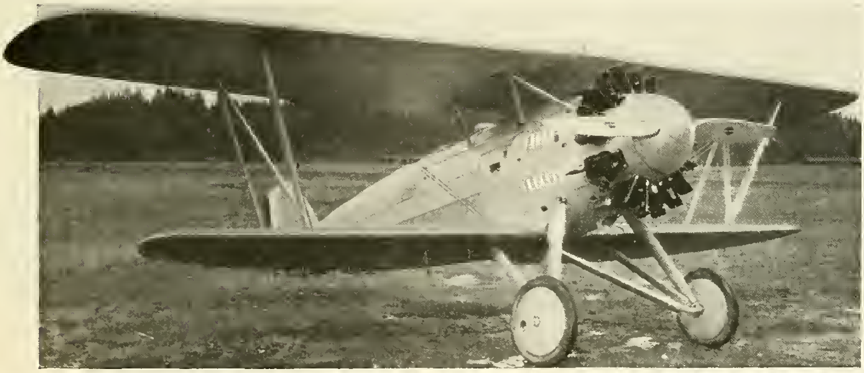
Original plant and three seaplanes of the Boeing Company in 1916. The construction shops are at the right rear.



The single-float Boeing training plane is a safe and efficient two-place instruction type.

to be used are ready for operation in the near future.

The Boeing pursuit types have gained great prominence in the military field. The PW 9-A is regularly equipped with the Curtiss D-12 engine, but is adaptable for use with a wide range of engines including the Pratt & Whitney "Wasp," as shown in the accompanying illustration. The general dimensions of PW9A type are: span of upper wing, 32 feet; lower wing, 22 feet 6 inches; height, 8 feet 10 inches; wing area, 242 square feet. The length varies according to the engine installed: with a Curtiss D-12 engine, the length is 23 feet 7 inches. Performance with the Curtiss D-12 engine: high speed 163 miles per hour; landing speed 65 miles per hour; rate of climb, 1,710 feet per minute; service ceiling, 20,175 feet. Equipped with the Packard 1-A-1500 engine with supercharger the plane is known as the model XP-4. In this type the span of both wings is 32 feet and the length 24 feet.



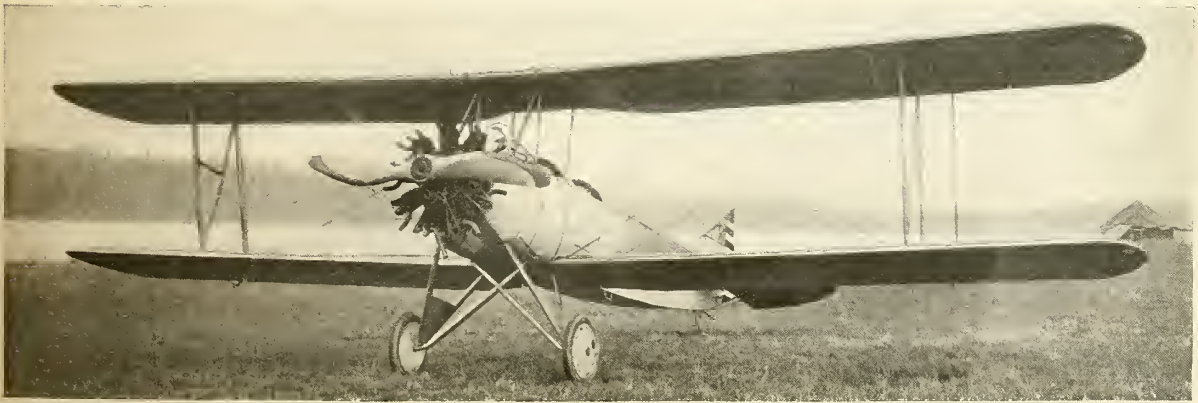
Boeing pursuit ship equipped with the 400 h.p. Pratt & Whitney "Wasp" engine.

The Boeing convertible training airplane won the Navy Training Plane Competition at Pensacola in 1924. This ship has a speed of 104 miles an hour equipped with a 200 h.p. radial 9-cylinder air cooled Whirlwind engine.

A patrol type plane, the PB-1 flying boat, was produced in 1925 for the U. S. Navy. Two 800 h.p. Packard engines are arranged in tandem. Light metal alloy is used in the construction. Its weight fully loaded is 25,000 pounds and it carries a crew of five. Eleven thousand pounds of fuel may be carried, enabling the ship to make a flight of 2,500 miles. It has a wing span of 87 feet 6 inches and is 59 feet 4 inches long.

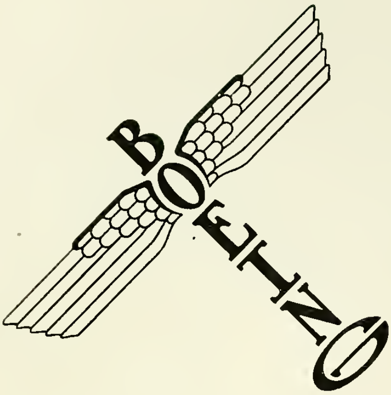
The latest training type of Boeing plane is also constructed so as to facilitate its conversion for land or water use. This type has a span of 38 feet 4 inches; length (not including float) 28 feet 5 inches; wing chord, 5 feet; span of tail, 11 feet 2 inches. The main float is 19 feet long and the overall height of the plane (with float) is 11 feet.

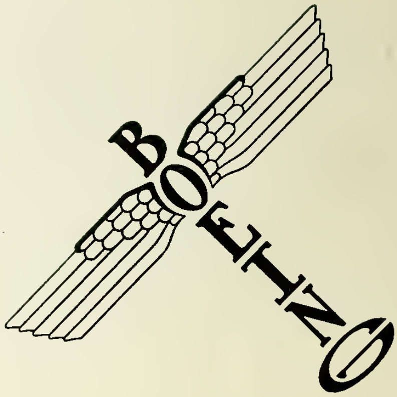
Another of the more recent types is the Boeing mail plane which is powered with the 400 h.p. Liberty engine. It weighs 3,425 pounds empty and 5,495 pounds fully loaded. It has a speed of 135 miles an hour and can climb to 10,000 feet in 18.5 minutes. Endurance at cruising speed, 7 hours.

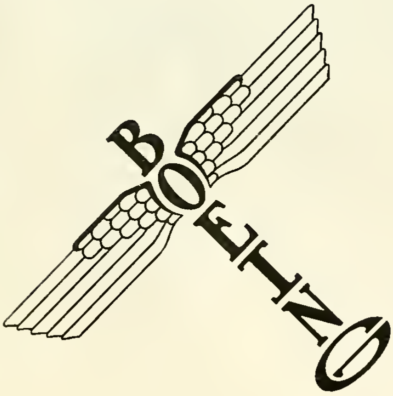


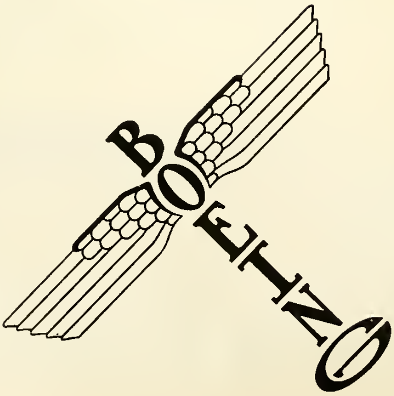
The Boeing training airplane is quickly convertible for use over water or land, as shown above.

BOEING









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THE INDEPENDENCE COMPANIES congratulate the Boeing Airplane Company and extend best wishes for the success of its planes and pilots as Uncle Sam's Mail Carriers.

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Pratt & Whitney "Wasp" Engine
Ignition equipment: two type AG 9-D

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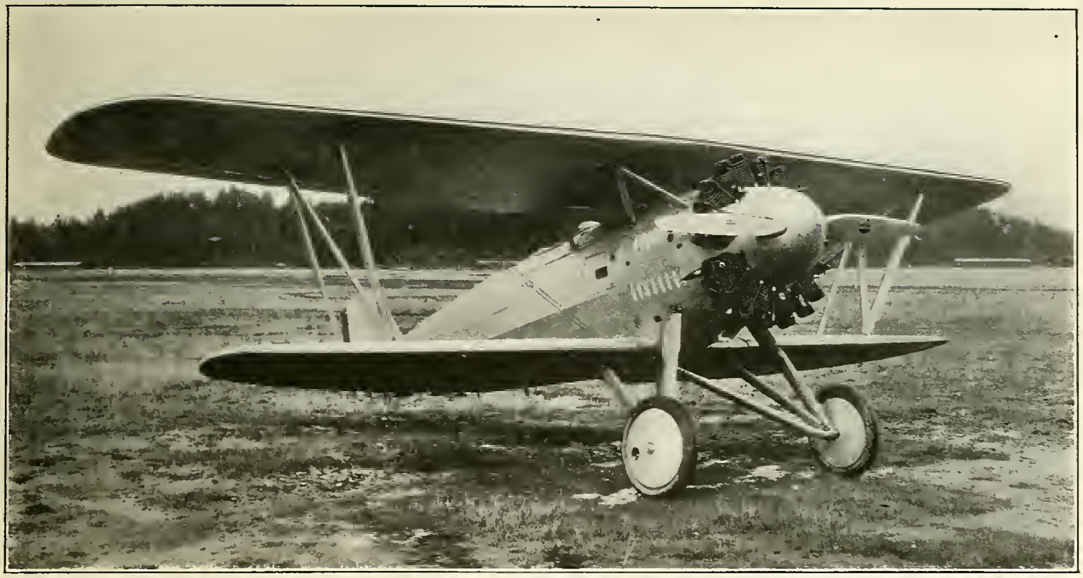
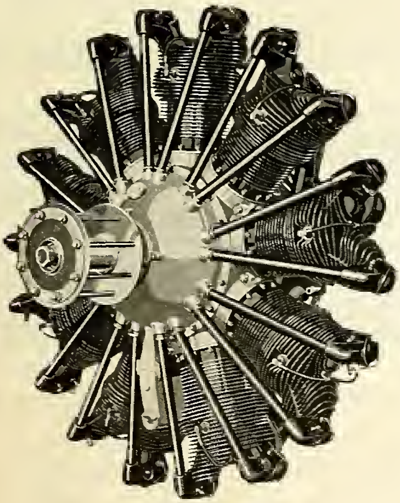


NAVY BOEING FIGHTER
EQUIPPED WITH
PRATT & WHITNEY "WASP" ENGINE



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425 H.P. at 1900 R.P.M.

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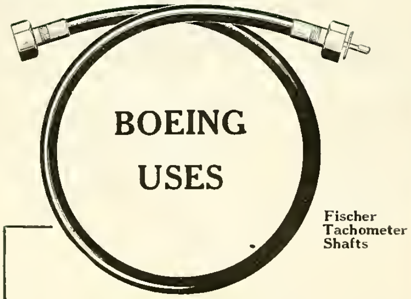

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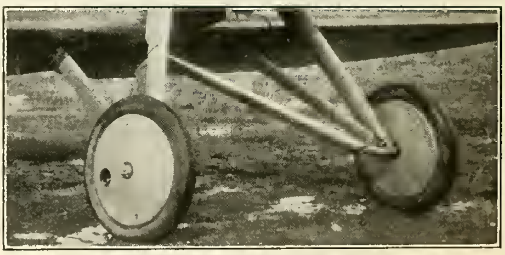

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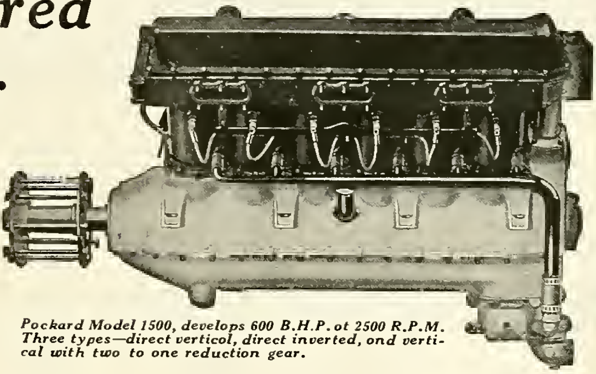

Packard Model 1500, develops 600 B.H.P. at 2500 R.P.M. Three types—direct vertical, direct inverted, and vertical with two to one reduction gear.

IN repeated service tests Boeing Pursuit Ships, powered with water cooled Packard engines, have consistently outperformed every other military pursuit ship, in both the air cooled and water cooled classes.

In the last National Air Races, a Boeing FB 3, powered with a Model 1500 Packard Engine, defeated a representative field of both air cooled and water cooled fighters, and established a new world's record for standard pursuit ships of 180.495 miles per hour. This record still stands.

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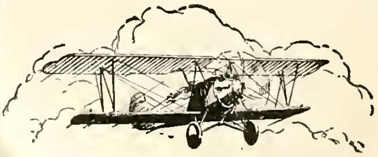
MACWHYTE Streamline Tie Rods give 10% greater flying efficiency. Wind resistance is cut to the absolute minimum. We will be glad to tell you the details. Macwhyte Company, 2907 Fourteenth Ave., Kenosha, Wis.



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Haskelite in Boeing Planes

THE Boeing Airplane Company, Seattle, Washington, uses HASKELITE extensively in building planes to meet the rigid specifications of their government contracts.

They write: "We have used a considerable amount of HASKELITE on government contracts and have yet to find a defective panel. We can truthfully say that to our knowledge there is no better plywood made than HASKELITE."

HASKELITE is uniform. Every panel has uniform light weight. Every panel has known strength. Every panel is absolutely waterproof. Boeing is not the first user to note the fact that there are no defective HASKELITE panels.

There are over 30 different applications of HASKELITE in aircraft construction. We'll be glad to send detailed information on request.

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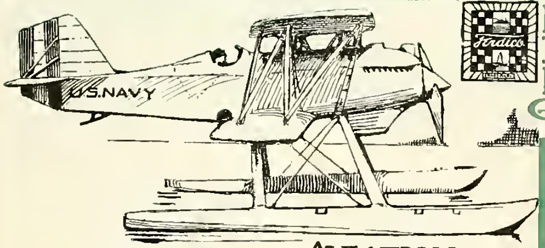

Ferdico AVIATION LIQUID MARINE GLUE

For Aircraft Pontoon Construction

First used in building pontoons at the U. S. Naval Aircraft factory and is now being extensively used in commercial service for both aircraft pontoon construction and double-plank boat-building.

The fact that the Ferdico Aviation Liquid Marine Glue between planking holds its elasticity, means that pontoons will continue to resist the shocks without leakage.

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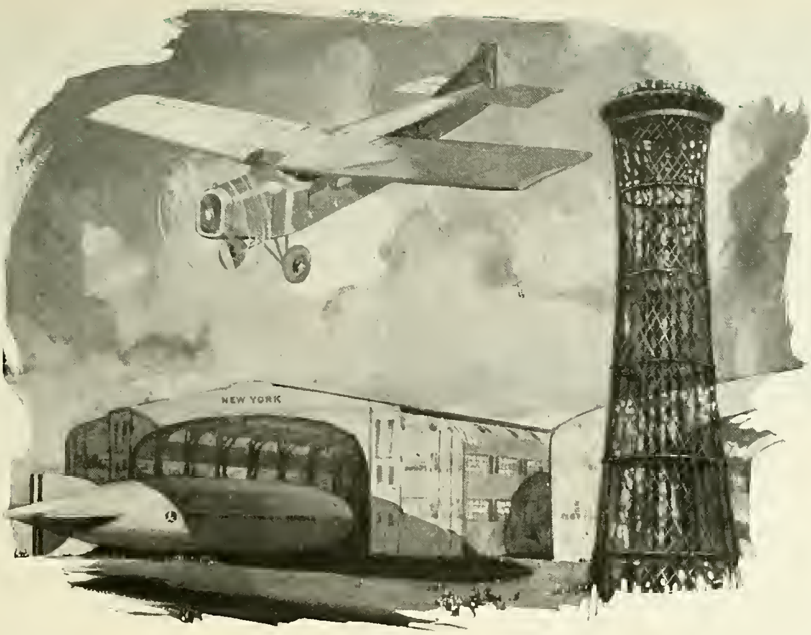

Austin Builds for Boeing

FOR the design and construction of modern hangars, airports, mooring masts, machine shops, aircraft buildings, etc., leaders in this industry are coming to Austin. Prominent among those who have found Austin engineering and building service a valuable ally is Boeing of Seattle (3 projects).

Austin numbers among its clients most of the other well-known names in aviation circles: Dayton-Wright, Glenn L. Martin, Ford Airport (hangar and mooring mast), Aircraft Development Corporation, Stout Metal Airplane Company. Recent contracts also include work for the National Advisory Committee on Aeronautics—a wind tunnel building at Langley Field for testing purposes.

Under the Austin Method of Undivided Responsibility, design, construction and equipment are all handled under one contract by one capable organization. Austin guarantees total cost for the complete project in advance, completion date with bonus and penalty clause if desired, and quality of materials and workmanship.

Whatever the nature of your project, Austin can help you. Just get in touch with the nearest office listed below or mail the Memo.

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Specification for
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FLIGHTEX fabric is used to cover the wings, fuselage and tail surfaces of Boeing airplanes.

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fills the requirements of
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that makes it good enough for anyone.

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Gentlemen:—Attention of Mr. W. F. Leicester. Replying to yours of the 25th inst., we wish to advise that we are using Casco glue in all our laminated spruce construction such as wing bows, box beams and in the wing frame assembly.

We find this glue meets our requirements to our entire satisfaction.

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The steel parts of all

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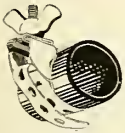

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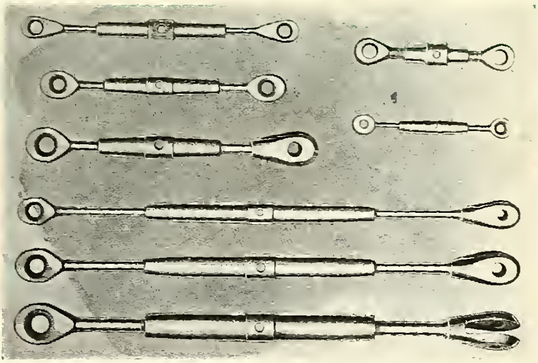

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Aircraft manufacturers who are building cabin type airplanes for passenger use will be particularly interested in the nonscatterable properties of Safetee glass.

Safetee glass is not a wire glass but a clear-vision polished plate glass that will not scatter or fly.

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AERO DIGEST
THE MAGAZINE OF THE AIR

takes great pleasure in presenting to the aircraft industry the selling messages of the organizations whose advertisements appear here in the Boeing Airplane section.

Because of the rapid growth and expansion of the aircraft field, manufacturers of aeronautical products must rely more and more on recognized sources of supply. The products of all advertisers in this section meet the rigid requirements necessary for the construction of aircraft acceptable to the Army, Navy, and the Department of Commerce.

THE HARRIS-RANKIN FLYING SERVICE, INC.

THE Harris-Rankin Flying Service, Inc., is the outgrowth of the recent reorganization of the Rankin Aviation Co., formerly located at Walla Walla, Washington, and founded in 1920 by J. G. "Tex" Rankin. Mr. Rankin was one of the first commercial pilots operating in the Northwest after the War and has been flying constantly ever since.

For the past seven years Mr. Rankin has specialized in instructing.

Mr. Rankin has carried more than 10,000 persons and flown more than 3,000 hours in commercial flying throughout Oregon, Washington, Idaho, Montana, California, Nevada, Arizona, New Mexico and British Columbia without an accident in which anyone was injured. He was the first pilot to land an airplane in America's most famous desert, Death Valley.

C. B. Harris, general manager of the H-R Flying Service is a well known timberman and saw mill operator in the Pacific Northwest. He is a graduate of the Rankin School, spring class of 1923. At the age of 45, Mr. Harris decided to learn to fly, and purchased an airplane to use in his timber business.

Finding aeronautics of more interest to him than the timber business, Mr. Harris disposed of most of his timber interest and became associated with Mr. Rankin in June, 1926, forming the Harris-Rankin Flying Service, Inc., of Portland, Oregon.

SHORT'S AIRPORT

WITH the approach of spring and better flying weather Short's Airport at 137th and Western Avenue, Los Angeles, report a marked interest in flying. They are receiving daily applications for terms and are enrolling new students for their spring course of flying and construction.

Short's Airport has built up with considerable rapidity, and has a class of over twenty students enrolled since the opening of their new field, which is modern in every respect. Visiting pilots will find gas service, repair facilities and day and night assistance. This summer they expect to put in lighting for night flying. The runway is 1,500 feet long by 100 feet wide with over a 100,000 square feet of hangar space. The field is marked with "T" and wind sock. Visitors are always welcome.

ROGERS AIRPORT

ROGERS AIRPORT has just leased a large tract of land five miles southwest of the center of Los Angeles. Hangars for twenty-two planes have been erected, and a complete shop and repair plant have been established. Aviation gasoline, oil and supplies of all kinds can be obtained here.

Rogers Airport, the pioneer flying field of Southern California, has been operating commercial aircraft with headquarters in Los Angeles for the past eight years. This field, the largest in the west, is a growing monument to successful operation of aircraft.

THE SAN GABRIEL VALLEY AIRPORT

THE San Gabriel Valley Airport, operated by the Callies Flyers, is located twelve miles east of Los Angeles on a concrete state highway and two miles southwest of El Monte, the end of the Santa Fé trail. It is 2,600 feet long north and south and 660 feet wide equipped with a wind cone and "T", and with gas, oil and water available. The altitude is about 400 feet. Fifteen students are enrolled in their school.

BURDETT AIR LINES

THE Burdett Air Lines, Inc., have been made distributers of International Aircraft and have made arrangements with the International Aircraft Corp. so that Burdett students may have access to the factory and thus have the opportunity to get a working knowledge of construction.

One of the fast little commercial jobs of the International Aircraft Corp. recently returned from a trip to Phoenix, Arizona, with two of the officers of the National Pictures Corp. as passengers. The 485-mile trip was made in 5 hours and 10 minutes including a stop at Yuma, Arizona, for refueling. Mr. McFarland and Mr. Hurtt of the National Pictures Corp. were so well pleased with the performance of the ship and the quick and comfortable manner in which the trip was made that they have put the Burdett Air Lines under contract.

THE REASON THAT

PREST AIRPLANES AND MOTORS

have sold more airplanes than all other aircraft companies on the Coast is that

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LEARN aviation in the most complete school in America.

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WARREN SCHOOL OF AERONAUTICS

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HERE'S an altitude record—right off the pan—for AERO DIGEST's Western Special.

Fifty per cent increase in air mail volume overnight for a daily average load of 500 pounds!

That's what Western Air Express, Inc., did on the change in air mail rates.

For ten months now the air mail contract lines of the country have been watching Western Air Express hang up a new poundage record every month. There were all kinds of guesses as to what would happen when the old per-ounce-zone rate was washed out in favor of the new 10 cent per half-ounce blanket postage on February 1.

Along in January the Western Air Express traffic department got busy. Result:

Beginning February 2, a conservative fifty per cent increase in air mail volume over the Los Angeles to Salt Lake City airway.

Proof that the Southern California mailers understand air mail service in all its details is found in the record which shows that of the more than 15,000 pieces of air mail cleared through the Los Angeles postoffice the night of February 1—occasion of the rate change—only one piece was found under posted and less than a dozen bore the old rate.

Along with this increase in business—an updraft that is still holding strong and driving the record sheets skyward—the operating department of Western Air Express is continuing to break all records for continued performance. With the winter practically behind them and more than 380,000 air miles to their credit they have yet to crack up or even seriously delay dispatch of the mails.

So near perfect has been the performance that mailers and air passengers on the Southern California end of the transcontinental airway swear by Western Air Express, Inc.

As a sample—Beth Beri, former Follies star and booked in vaudeville as the "Girl with the Million Dollar Legs", entrusted her breadwinning nether extremities to Western Air Express for delivery on time in the fastest transcontinental trip ever taken by a civilian booking passage on only scheduled vehicles.

Miss Beri accepted an engagement to appear in San Diego the night of February 10. Subsequently she found previous contracts required her appearance in New York City on February 14. She couldn't afford to break either date, and no known train schedule could get her closer than Chicago to the Great White Way in the limited time.

So she called on Western Air Express who, through the concord it maintains with western railroads, arranged details of her trip, secured her tickets and reservations and then instructed her what to do.

Closing in San Diego at midnight February 10, Miss Beri boarded the Santa Fe train at 2 a. m. February 11. Under special arrangements this train stopped at the Western Air Express airport, Los Angeles, at 7:10 a. m.

At 7:35 a. m. she hopped off in the regular mail plane for Salt Lake City where, thanks to the airplane, she overtook and boarded the Los Angeles Limited (Union Pacific extra-fare fast train) which put her into Chicago for further connections which landed her on Broadway Monday noon.

ALEXANDER OFFERS NEW INSURANCE PLAN

IN conjunction with their time payment plan, the Alexander Aircraft Company put into effect on February 1 a new airplane insurance plan which is another long step forward in the popularization of airplane ownership.

The Eaglerock time payment plan enables a pilot to pay his deferred payments as they come due out of earnings and from commissions on his sales of Eaglerocks. The purchase plan is the same upon which many commodities are bought except that in addition to a mortgage on the ship it is required that two property owners co-sign the note with the purchaser. If suitable security is furnished, co-signers are not necessary.

Without additional cost the Alexander Company offers to insure the purchaser and his dealer and co-signers against having to pay for a "dead horse" in that they will cancel all payments on notes that may come due after the ship is accidentally totally destroyed (fire damage excepted).

HOW

—can the Eaglerock perform so well in high altitudes?

HOW

—did the Alexander Aircraft Company make such progress in one year?

HOW

—can I decide which is the right ship to buy?

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New Mexico—Swastika Eaglerock Airways, 312 Columbia, Alberquerque, New Mexico
Okla. and Texas Panhandle—Southwest Airplane Sales Corp., Okla. City, Oklahoma
W. Missouri and E. Kansas—Bennett Eaglerock Sales Co., Kansas City, Missouri
E. Missouri and Arkansas—Bridgeton Aircraft Corporation, St. Louis, Missouri
Louisiana—Louisiana Airways, 1712 Marquette Bldg., New Orleans, Louisiana
Virginia and North Carolina—Charles Flying Service, Richmond, Virginia
Southern California—Aero Corporation of California, Los Angeles
Indiana—Captain J. A. Yonge, Box 1185, Indianapolis, Indiana
Wyoming and Montana—Wyoming Airways, Casper, Wyoming
Northern California—W. L. Lamkin, Porterville, California
Southern Texas—Dick Hair, Box 420, San Antonio, Texas
South Dakota—Rapid Airlines, Rapid City, South Dakota
Western Kansas—C. E. Steele, Dodge City, Kansas
Illinois—Sievert Aircraft Corp., Chicago, Illinois
Michigan—Niles Airways, Niles, Michigan

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Ryan Air Lines, Inc.
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Travel Air Mfg. Co., Inc.
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MANY months of time and effort have been spent by Alexander Aircraft Company of Denver, Colorado, testing various lacquers under actual flying conditions in an effort to find the *ideal finish* for "Eaglerock" planes.

It is therefore a matter of more than passing significance that, of all the finishes tested, Aircraft Berryloid has been the one selected to protect and beautify these high-grade ships.

This same long-wearing, high-luster pyroxylin finish—which resists the effects of gas, oil, salt water, sun and the elements—is the standard finish on all aircraft manufactured by the well-known companies listed at the left.

Buyers of planes built by these companies are assured the best-finished ships on the market.

For detailed information, color cards or booklets about Berryloid and Lionoil, write Aviation Department, Thomas B. Colby, Manager.

BERRY BROTHERS INC.

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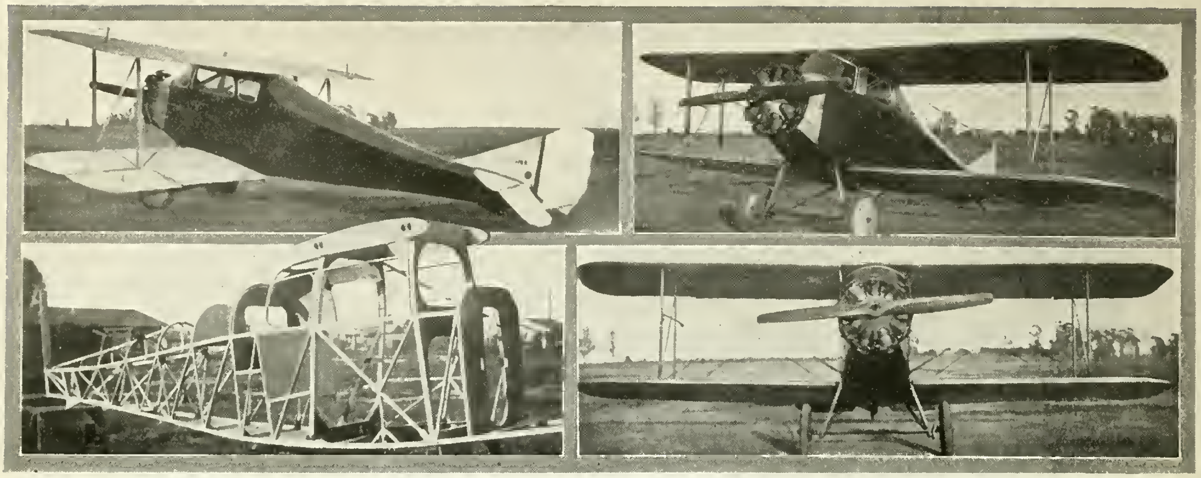

The Bach type C-S-1 sport coupe, powered with a Super Rhone engine, has a speed of 107 m.p.h.

BACH SPORT COUPE

THE fuselage of the Bach C-S-1 Sport Coupe is of girder type with mahogany veneer covering. It has a three-place pilot cabin in front and accommodations for two passengers in the rear. Controls are concealed, out of reach of passengers but easy of inspection. The stabilizer is adjustable. The very compact Bakelite instrument board has a full set of instruments, mounted on 9 by 13 inch panel. Wings are conventional—single spar, built-up web. The span is 25 feet 6 inches; chord, 5 feet; wing area, 220 square feet; gap between wings, 4 feet 6 inches; length, 20 feet 4 inches; useful load, 825 pounds.

High speed, 107 m. p. h., cruising speed, 90 m. p. h., landing speed, 30 m. p. h. Engine, Super-Rhone. Climb to 5000 feet at the rate of 500 feet per minute.

SIDE LIGHTS ON THE CATALINA ISLAND SWIM

By Guy Sterling Dark

WHEN residents of various cities in the eastern part of the continent purchased their evening paper one day last January and found that they were privileged to gaze on photographs of an event that had taken place three thousand miles from them late that very morning, they no doubt meditated on the marvels of the telephone but few of them if any dreamed that aviation had played an important part in transmitting these pictures to them. As a matter of fact the airplane was responsible for the photos being in the evening editions of their papers; had it not been for an airplane these pictures would not have appeared until the following morning.

I naturally assume that everyone in the country knows that recently, in company with one hundred and ten other assorted swimmers, George Young dove off the north side of Catalina Island and set out to swim to the mainland some thirty miles away. I assume that they also know that in a little more than fourteen hours later George Young crawled out of the surf and onto a rock near Point Fermin on the mainland, and was acclaimed winner of the classic Wrigley Publicity Scheme. News of Young's achievement was immediately flashed to all parts of the civilized world and by morning he was the acknowledged hero of the day. I do not wish to appear flippant for I believe that by completing this swim George Young has done a truly stupendous thing and whatever acclamation, notoriety, publicity, or monetary reward was accorded him was rightfully deserved and manfully won. But George Young's deeds have been thoroughly broadcast and I want to bring out that there were others who crossed the Channel in a manner worthy of note.

None of the others I grant you accomplished anything that can be compared in magnitude to the remarkable achievement of George Young. Still I have always contended that the devil should be given his due and I am personally acquainted with at least three devils who in this instance have not had their dues even slightly tended to. For instance—while this article is intended primarily to deal strictly with aviation allow me to insert this by way of human interest—permit your mind to dwell a moment on the man that rowed an open skiff beside George Young all the way from Catalina to the mainland. No mean feat that! But he can't be considered at this time. What I do want to consider is the pilot who flew the airplane to Catalina, landed, and returned with the photographs showing the start of the race.

I will admit that at first glance there appears to be nothing extraordinary connected with this flight. And had the plane been a seaplane there would have been nothing extraordinary. But it was a land plane and the first one to cross the Channel and land on Catalina Island. Further this plane was responsible for the Panda Photo Service making one of the biggest photographic "scoops" of the year. The affair is a small romance in itself and in my opinion well worth recording.

"Hello, Jack! Listen to a hard luck story," said Harry Sanders of the Panda Photo Service over the telephone to Lieut. Jack Frye of the Aero Corp. of California. "You know I had it all set for me to use a seaplane tomorrow to bring my pictures back from Catalina as soon as the race started and now I've just gotten word that there was a mix up some place and one of my competitors is going to use it. I'm out of luck unless I want to use a speed boat and if I do that I stand a chance to have every other photo syndicate in the country beat me back to the telephone with their pictures. My only hope is to fly, Jack. What can you do for me?"

"Not very much, Harry. There's no place to land on Catalina and we have no seaplane you know."

"Well, if I send a couple of men over to the island right away to hunt up a landing field will you take a chance on going over with me this afternoon?"

"I guess so. But you send your men over first and have them phone hack if they find anything."

"O. K. I'll phone you as soon as I hear from them."

When I got to the Aero Corp. field on that particular afternoon Sander's men had located a field—not very good they said but big enough to land in and to take out of provided the plane was handled with considerable care. Sanders was on his way out and the boys on the field were servicing the long wing Eaglerock for the trip. Lieuts. Frye and Richter had a map spread over the turtleback of the plane and were discussing the lay of the land at Catalina. Hamilton, the chief mechanic, was fussing around the motor. He has a way with motors! Give him an ordinary OX5 with no particular virtues to distinguish it from any other OX5 and he will take it into the shop, pull it to pieces, throw away some of the parts, add special parts of his own, fuss with its insides for awhile and put it back together. When you call for it you find that it isn't quite an OX5 any more. It'll give you more horses and turn up at least a couple of hundred more revolutions per minute. A Hamilton Rebuild is synonymous to a super-super-OX5. It was one of Hamilton's rebuilds in the long wing Eaglerock and he was particularly fond of that motor. I knew that if that motor missed a stroke on the way to or from the island and Hamilton heard of it he

(*Continued on page* 218)

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thoroughly covering the basic and elementary principles of flying, airplane design and construction, airplane engines, meteorology, and over twenty other subjects pertaining to aviation. In connection with this HOME STUDY COURSE we announce this—

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The New
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Is now equipped with the new Kinner five-cylinder radial air cooled 100 h.p. motor. Weight 211 lbs.

This new motor is also available to the trade

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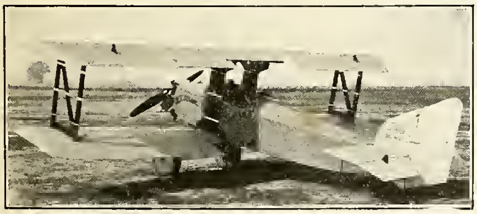

MODEL M-T-2

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WORLDS FIRST LIGHT PLANE
1 and 2 Passenger Single Motor Types
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WESTERN AVE. AT 99TH ST. LOS ANGELES
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SOUTHERN CALIFORNIA - ARIZONA

Continued from page 216)

would worry over it for days.

I suppose I should explain for the benefit of those who do not know that Catalina is a good sized mountain rising suddenly out of the Pacific—the sort of a mountain that an aviator would avoid if possible when making a landing. What I mean to convey is that Catalina is a series of steep hills cut with deep ravines—there is very little flat space on the island.

Jack Frye told me later that when he took off to go to Catalina the possibility of being forced down in the channel scarcely entered his mind. He worried mostly over the sort of a field he was going to find and kept hoping that the men that selected the field knew something of aviation. As it turned out the men both knew what would be needed and had picked out the best spot and about the only spot on the island where a ship could be set down. The field that they had chosen was about twelve miles inland from the beach where the race was to start. Jack of course knew approximately where the field was from the information they had given Sanders over the phone and when he arrived over it was able to locate it easily by a landing "T" that the men had made out of cheese cloth and staked to the ground. The field was at the bottom of a fairly deep valley and the direction of the wind "T" pointed out further difficulties. The field was too short to try a landing with a tail wind and the only way to get in with a head wind was to fly through a narrow and crooked canyon for the distance of about a half a mile.

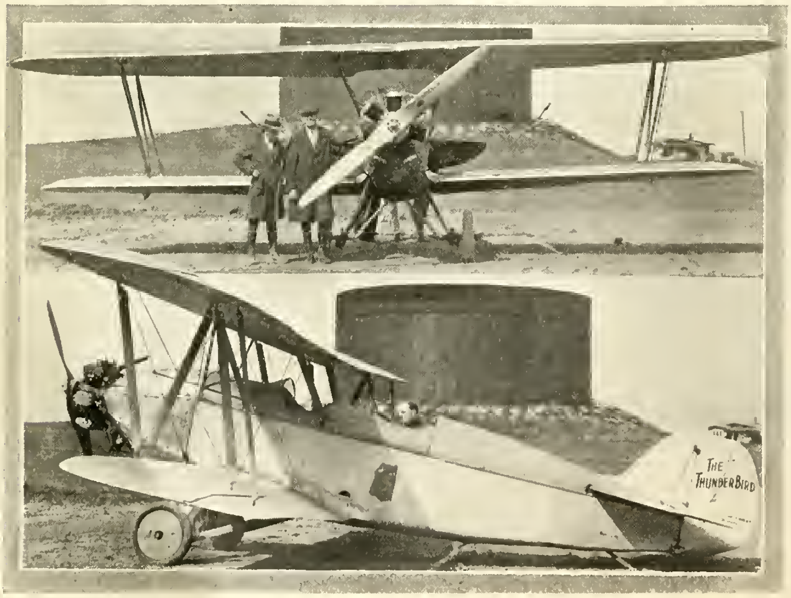
I think Jack must have crossed his fingers when he started into the canyon. He told me that in some places there was barely room for the wings of the ship and he had to bank way up on the turns in the canyon in order to keep the wing tips from touching the sides. He admits that it was tough flying in the canyon and when Frye admits that you can feel sure that it was tough. Once out of the canyon though he says the rest was easy; merely a matter of fish-tailing the Eaglerock down and setting it on the floor of the valley.

At the press camp there was much speculation amongst the photographers as to which of them would be the first to telephone with their pictures the next day. The more sanguine cheerfully predicted that Frye and Sanders would never be able to get their plane off the island. They figured on a crack-up on the take-off. Others were more optimistic and felt that Frye would get off all right but they refused to concede a victory of more than five or ten minutes at the most to Sanders. They pointed out that the Eaglerock was twelve miles inland and it would take some time to get the plates to the ship. The seaplane and the speed boats were already in the water only a few feet from where the race was to start and could leave without delay as soon as the pictures were taken.

The race was scheduled to start at eleven in the morning. Jack and Sanders, however, went back to the plane long before that so that they could get it serviced and ready to take off the minute the plates arrived from the beach. The plates were to be sent up by motorcycle as soon as they were exposed. Special stunt riders had been sent over to do this job. Jack says that when they got to the field they found that the wind had shifted over night and was blowing from the opposite direction which meant that they would have to take off up the canyon which was far more hazardous than flying down it as they had the night before, as the plane would be laboring in a climb. Jack admits that he didn't like the looks of it and I guess Sanders didn't either although neither of them said anything about it. They warmed up the motor and then sat down to wait and probably did considerable thinking which didn't help their nerves any. They were both glad to hear the motorcycles coming at about eleven-thirty and climbed into their cockpits. Sanders took the plates from the riders and Jack gave the ship the gun and headed up the canyon. Their worries proved to be mostly unfounded for before they were half way through the canyon they had climbed out of it and were clear of the hills. Jack banked the ship over and flew across the beach. They could see the swimmers just off shore and were pleased to note that the seaplane was flying around shooting pictures from the air. A few of the speed boats had started for mainland but were not more than a mile or two away.

I was on the Aero Corporation field that afternoon when Jack brought the Eaglerock home. He took off his helmet and asked me to look and see if there were many grey hairs. I couldn't find any grey hairs but I know how he felt.

Panda got their pictures on the phone nearly two hours before their closest competitor. Their pictures were in the east and on the street over an hour before anyone else got into the city with plates.



The "Thunderbird," powered with the new Bailey engine.

NEW VENTURA AIRPORT

THROUGH the efforts of M. E. McKeen, chairman of the Aero Committee, and Lew Carrigan, secretary, the Chamber of Commerce of Ventura, Calif., is considering the purchase of a larger and more conveniently located airport. The present field is located at the western edge of the city, the approach to the T being directly over a long white concrete bridge spanning the Ventura river. The south and west boundaries are formed by the old Pacific, the Southern Pacific trailing along the edge of the ocean. The north boundary is the State Highway. The prevalent wind is from the west.

The Ventura Flying Club, who use the field, consists of about twenty-five members the plane owners being John Thille, Berger Johnson, Roy Priest and M. E. McKeen.

"THUNDERBIRD" PLANE

By Captain C. D'Urban Shearing

THE "Thunderbird" airplane designed and built by Theodore A. Woolsey is one of the most popular airplanes on the Pacific coast. Inasmuch as it won the speed classic race at Clover field, Santa Monica, on the second anniversary of the Round the World Flight, its fame has spread throughout the United States and also Canada. The "Thunderbird" also was among the first three in the altitude contest held on the same day.

The airplane at the time of the Air Meet was equipped with an OX5 90 h.p. motor, which has since been replaced by a Bailey C7R radial 120 h.p. motor, which has added greatly to the general efficiency of the airplane. The "Thunderbird" has been flown by many of the best known fliers on the Pacific Coast, among whom are Captain Maurice-Graham of the Western Air Express, and Art Goebel, the famous stunt pilot.

All the pilots that have flown this plane state that this ship is unusually stable and at the same time handled with exceptional ease at all speeds.

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OX5 Standard or Oversize Rings	.15
Hub Puller	1.00
.003 Oversize Wrist Pins	.50
Jenny Landing Gear Struts—Front ea. $1.25 Rear ea.	1.75
Wing Skids—Steel (each) $1.00—Wood (each)	.75

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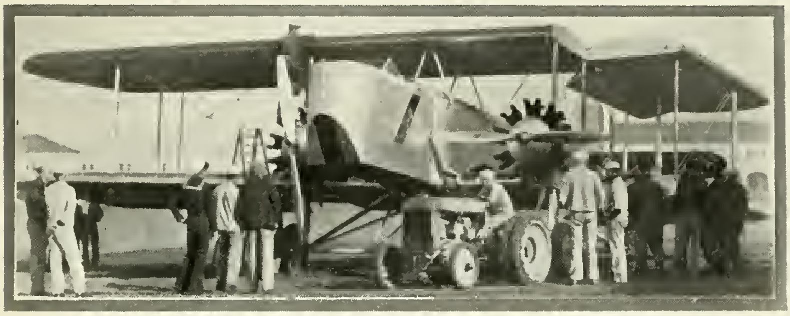
NEWS OF THE AIR SERVICES



The new twin-motored Douglas T-2-D Navy bomber. *Herbert Photo.*

THE ARMY GOOD WILL FLIGHT TO CANADA

TWELVE pursuit ships and one Douglas Transport took off from Selfridge Field, Mt. Clemens, Mich., January 24th on a flight to Canada, the purpose being to provide a practical test in mobility of the present type of pursuit planes under the most severe conditions that can be found in the vicinity of that field. This flight was the first test to date with a view of ascertaining the mobility of pursuit ships when equipped with skis in extremely cold weather. Previous maneuvers of the 1st Pursuit Group have had to do with the operation of planes and machines in severe cold weather at Oscoda, Mich., and in these maneuvers the fliers learned valuable lessons in winter flying.

Another very important reason for making the flight into Canada was to comply with urgent requests of representatives of the Canadian Government, as well as prominent Canadian citizens, that a flight from Selfridge Field visit some portion of Canada while in maneuvers for the purpose of stimulating there greater interest in aviation, both commercial and military.

Officers participating in the flight were Major Thomas G. Lanphier, 1st Lts. St. Clair Streett, L. C. Mallory, A. G. Liggett, G. G. Finch, F. C. Crowley, 2nd Lts. J. J. Williams, L. H. Rodieck, L. C. Ellicott, Lee Gehlbach, C. H., Deerwester and J. G. Hopkins. The Douglas Transport carrying mechanics and supplies for the flight was piloted by Staff Sgts. Archie Bailey, Barney E. Fuller, Frank Deeman, Earl B. Redifer and Sgt. Wm. H. Ross.

With the precision of taxicabs keeping a train appointment, the 12 airplanes landed on the ice of the Ottawa River shortly after noon of the 24th, after a flight of 430 miles from Selfridge Field, and taxied on their skis to parking places on the river bank. The non-stop flight to Ottawa was a complete success, the average speed being about 135 miles an hour and the distance being covered in two hours, 55 minutes.

On the following day the American airmen continued their friendly invasion of Canada by a flight to Montreal, 100 miles distant. Extremely cold weather delayed the flight several days at Montreal. From Montreal the Pursuit Group fliers pointed their ships to Buffalo, N. Y., and the return flight to Selfridge Field was completed at 2:00 p. m., January 30th.

PAN-AMERICAN FLIGHT PROGRESS

FOUR Army planes of the Pan-American good-will flyers arrived at Bahia Blanca, Argentina, on February 24, after spanning the southern part of South America from Valdivia, Chile, and crossing the lower part of the Andes Mountains and the Argentina Pampas safely.

The San Antonio, which was dropped behind at Tumaco, Colombia, due to a damaged motor, left Lima, Peru, on February 24 on its journey to overtake the other planes.

NEW DOUGLAS BOMBER

ALTHOUGH the new Douglas T-2-D Navy bomber has not completed full performance tests, it has shown evidence of remarkable high speed and take-off with full military load, equipped with metal pontoons.

The Navy trial board is very enthusiastic over its performance. It will be taken on cruise on board the Langley with them even though the full performance has not been completed. The board feels that inasmuch as it has so far exceeded the specified requirements on that part of the performance test that has been completed that it will more than meet the remaining test requirements.

The plane is a combination torpedo carrier, observation and bombing plane, with folding wings, bullet-proof glass observation windows, and twin 435 h.p. air-cooled tractor engines driving Standard Steel propellers. Landing gear wheels may be used to replace the pontoons.

NAVY NOT TO ENTER 1927 SCHNEIDER RACE

THE Navy will not take part in the Schneider Trophy race which will be held at Venice, Italy, during September, 1927, according to a decision made at the Paris conference of the Federation Aeronautique Internationale on January 25. Keen disappointment is felt over the Navy's decision, not only from the point of view of the value of these competitions in developing service planes, but from a sporting standpoint as another victory would have given America permanent possession of the trophy. However, this does not mean that this country need not be represented by private citizens.

The recent decision of the FAI nullifies that arrived at last October in Rome to hold the Schneider Race every two years. It was also decided that the rules pertaining to the race held in 1926 would also govern the competition to be held in 1927; and that after the country wins the race three times within a period of five years, as now provided, the cup would become that country's permanent property.

Group of U. S. Army pursuit planes from Selfridge Field, equipped with skis on the ice at Ottawa, Canada. *P & A Photo.*

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ARMY AND NAVY AIR SERVICE ORDERS

ARMY AIR CORPS ORDERS

THE following Army Air Corps orders have been issued as of the dates indicated in brackets:

Brand, 1st Lt. Harold, from Brooks Field, Tex., to Fort Sam Houston, Tex. (Feb.12)

Clark, 2d Lt. Ray Henry, promoted to 1st Lt. Nov. 21, 1926. (Jan. 28)

Coughlin, 2d Lt. William L., Field Artillery, detailed to Air Corps; proceed from Fort Sam Houston, Tex., to Brooks Field, Tex. (Feb. 4)

Day, 1st Lt. Robin A., from foreign service to Brooks Field, Tex. (Feb. 12)

Foulk, 1st Lt. Albert C., from Hawaiian Dept., to Engineering School, McCook Field, Ohio. (Feb. 12)

Haddon, 1st Lt. Julian B., from foreign service to Selfridge Field, Mich. (Feb. 12)

Hardy, 2d Lt. Wilfrid H., relieved from assignment as student at Air Corps Flying School, Kelly Field, Tex., upon completion of present course of instruction about March 1, 1927; report to commandant Air Corps Advanced Flying School, Kelly Field, for duty. (Feb. 19)

Harmon, Maj. Millard F., Jr., relieved as member General Staff Corps; report to Chief of Staff for duty. (Jan. 28)

Heiser, 2d Lt., Benjamin Peter, transferred from Air Corps to Field Artillery; report to Fort Sam Houston, Tex. (Feb. 21)

Hodgson, 1st Lt. Jack C., Brooks Field, Tex., report to commanding general Air Corps training center for duty at his headquarters. (Jan. 20)

Johnson, 2d Lt. Charles Wesley, from duty at Brooks Field, Tex., to Amarillo, Tex., where he will stand relieved from duty. (Jan. 28)

Kauch, Capt. Robert, from foreign service to Brooks Field, Tex. (Feb. 12)

Kenford, Staff Sgt. Jack E., from Selfridge Field, Mich., to Chanute Field, Ill. (Jan. 24)

Klein, 2d Lt. Frank D., relieved from assignment as student at Air Corps Flying School, Kelly Field, Tex., upon completion of present course of instruction about March 1, 1927; report to commandant Air Corps Advanced Flying School, Kelly Field, for duty. (Feb. 19)

Koontz, 1st Lt. Leonidas L., from foreign service to Brooks Field, Tex. (Feb. 12)

Loutzenheiser, 2d Lt. Joe L., relieved from assignment as student at Air Corps Flying School, Kelly Field, Tex., upon completion of present course of instruction about March 1, 1927; report to commandant Air Corps Advanced Flying School, Kelly Field, for duty. (Feb. 19)

Lundberg, 1st Lt. George G., from foreign service to Scott Field, Ill. (Feb. 12)

Magee, 1st Lt. Richard M., from foreign service to Chanute Field, Ill. (Feb. 12)

Maughan, 1st Lt. Russell L., from Kelly Field, Tex., to Salt Lake City, Utah. (Jan. 20)

Meissner, 1st Sgt. Paul H., Fort Crockett, Tex., retired. (Feb. 16)

Murray, Capt. John T., Inf., detailed to Air Corps; proceed from Fort Benning, Ga., to Brooks Field, Tex. (Feb. 4)

Norwood, 2d Lt. Donald Wallace, promoted to 1st Lt., Dec. 11, 1926. (Jan. 28)

Parkin, Capt. Walter F., Jr., relieved from treatment, Walter Reed Hospital, Washington, D. C.; return to Langley Field, Va. (Jan. 28)

Pike, Lt. Col. Shepard L., relieved from assignment and duty as student, Army War College, Washington, D. C.; report to commandant Army War College for assignment to duty as instructor. (Jan. 20)

Randolph, Capt. William M., leave of absence, 3 months. (Feb. 4)

Reynolds, Capt. Clearton H., from Bolling Field, D. C., to Fort Sam Houston, Tex. (Feb. 12)

Robinson, Staff Sgt. William T., from Chanute Field, Ill. to Selfridge Field, Mich. (Jan. 24)

Schneider, 1st Lt. Max E., from foreign service to Brooks Field, Tex. (Feb. 12)

Walch, Lt. Frederick Edward, Jr., (Reserve), detached from Brooks Field, Tex., to Watertown, Mass. (Feb. 4)

Walsh, 1st Lt. Edward J., assigned to Fort Benning, Ga. (Jan. 20)

Wimsatt, Robert William Calvert 2d Lt., promoted to 1st Lt., Dec. 28, 1926. (Feb. 16)

Wisehart, 1st Lt. Harry C., from foreign service to Brooks Field, Tex. (Feb. 12)

NAVY AIR SERVICE ORDERS

THE following Navy air orders have been issued as of the dates indicated in brackets:

Albertson, Ens. Donald G., detached Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va., to *U.S.S. Williamson.* (Feb. 5)

Alexander, Lt. Comdr. James T., detached Off. in Chg., Navy Rctg. Sta., Salt Lake City, Utah, to c.f.o. *U.S.S. Saratoga.* (Jan. 18)

Atkins, Lt. Comdr. James G., detached Asst. Nav. Inspr. of Mach., Bethlehem Shipbldg. Corp., Quincy, Mass., to c.f.o. *U.S.S. Lexington.* (Jan. 27)

Bates, Lt. Comdr. Paul M., detached Gen. Inspr. of Naval Aircraft, Central District, McCook Field, Dayton, Ohio, to Naval War College, Newport, R. I. (Feb. 10)

Beakley, Ens. Wallace M., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 22)

Berner, Lt. (j.g.) Warren K., orders January 28, 1927 to *U.S.S. Colorado* revoked; continue duty with VO Sqdn. 2 *U.S.S. Nevada.* Aircraft Sqdns., Battle Flt. (Feb. 10)

Boone, Lt. Walter F., detached VO Sqdn. 3, *U.S.S. Cincinnati,* Aircraft Sqdns., Sctg. Flt., to VO Sqdn. 3, Aircraft Sqdns., Sctg. Flt. (Feb. 10)

Buehler, Lt. Albert R., orders January 31, 1927, to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va., revoked; continue duty with VO Sqdn. 1, *U. S. S. Pennsylvania,* Aircraft Sqdns., Battle Flt. (Feb. 5)

Burroughs, Ens. Sherman E., jr., detached Nav. Air Sta., Pensacola, Fla., to VF Sqdn. 6, Aircraft Sqdns., Battle Flt. (Jan. 22)

Buse, Lt. Frederick R., detached VF Sqdn. 6, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Anacostia, D. C. (Jan. 20)

Clark, Lt. Joseph J., detached VO Sqdn. 2, *U. S. S. Mississippi,* Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Hampton Roads, Va. (Feb. 2)

Coe, Lt. (j.g.) Charles F., detached VO Sqdn. 1, *U. S. S. Maryland,* Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 2)

Cogswell, Lt. (j.g.) Wilson P., detached VO Sqdn., *U. S. S. Arizona.* Aircraft Sqdns., Battle Flt., to VO Sqdns. 1, Aircraft Sqdns., Battle Flt. (Feb. 9)

Cotton, Lt. (j.g.) Clement F., (C.C.), detached Navy Yard, New York, to Nav. Air Sta., Lakehurst, N. J. (Feb. 9)

Cunningham, Lt. Winfield S., orders January 28, 1927, to *U. S. S. West Virginia,* revoked; continue duty with VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Feb. 9)

Dillon, Lt. Wallace M., detached Advanced Flying School, Kelly Field, Texas, to VF Sqdn. 5, Aircraft Sqdns., Sctg. Flt. (Jan. 21)

Dolecek, Lt. Edward E., detached VO Sqdn. 3, *U. S. S. Raleigh,* Aircraft Sqdns., Sctg. Flt., to VO 3, Aircraft Sqdns., Sctg. Flt. (Feb. 10)

Dreller, Lt. Louis, detached Asst. to Nav. Inspr. of Engr. Mat'l, Bethlehem Shipbldg. Corp., Quincy, Mass., to c. f. o., *U. S. S. Lexington.* (Jan. 27)

Durgin, Lt. Calvin T., orders January 31, 1927, to Nav. Air Sta., Hampton Roads, Va., revoked; continue duty VO Sqdn. 2, *U. S. S. New Mexico.* Aircraft Sqdn., Battle Flt. (Feb. 5)

Ellis, Ens. Norman W., orders January 29, 1927, modified, to VO Sqdn. 2, Aircraft Sqdns., Battle Flt., *U. S. S. Oklahoma.* (Feb. 9)

Ewen, Lt. (j.g.) Edward C., detached VF Sqdn. 6, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Pensacola, Fla. (Feb. 10)

Farnsworth, Lt. Comdr. John S., detached command VO Sqdn. 6, *U. S. S. Arkansas,* Aircraft Sqdns., Sctg. Flt., to Gen. Inspr. of Nav. Aircraft, Central District, McCook Field, Dayton, Ohio. (Feb. 10)

Fines, Ens. Clifford A., detached Nav. Air Sta., Pensacola, Fla., to *U. S. S. McFarlond.* (Feb. 1)

Gardner, Lt. Matthias B., detached Advanced Flying School, Kelly Field, Texas, to VF Sqdn., Aircraft Sqdns., Sctg. Flt. (Jan. 20)

Grooch, Lt. William S., orders January 28, 1927, to VO Sqdn. 1, Aircraft Sqdns., Battle Flt., revoked: continue duty with VO Sqdn. 2, Aircraft Sqdns., Battle Flt. (Feb. 9)

Greher, Lt. (j.g.) Charles F., detached VO Sqdn. 2, *U. S. S. Oklahoma,* Aircraft Sqdns., Battle Flt., to VF Sqdn. 2, Aircraft Sqdns., Battle Flt. (Feb. 10)

Hake, Lt. Harry F. (S.C.) desp. orders January 14, 1927, to Aircraft Sqdns., Battle Fleet, revoked; continue duty Nav. Supply Depot, San Diego, Calif. (Jan. 22)

Harris, Lt. (j.g.) Edward M., (M.C.) detached Nav. Air Sta., Anacostia, D. C., to Nav. Med. School, Washington, D. C. (Jan. 22)

Hasselman, Lt. George H., detached VF Sqdn. 6, Aircraft Sqdns., Battle Flt., to Nav. Oper. Base, Hampton Roads, Va. (Feb. 2)

Havill, Lt. Clinton H., detached Nav. Air Sta., Lakehurst, N. J., to Bureau of Aeron. (Feb. 10)

Hazard, Lt. (j.g.) Harold G., detached VF Sqdn. 6, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 2)

Judson, Lt. (j.g.) Charles H., detached Nav. Air Sta., Pensacola, Fla., to *U. S. S. S-7.* (Feb. 2)

Kindell, Lt. Nolan M., detached VF Sqdn. 6, Aircraft Sqdns., Battle Flt., to Naval Academy. (Jan. 26)

King, Lt. (j.g.) John W., 3d, detached VT Sqdn. 2, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 2)

Leahy, Lt. William I., detached Nav. Air Sta., Lakehurst, N. J., to *U. S. S. West Virginia.* (Feb. 2)

Lonnquest, Lt. Theodore C., detached Aircraft Sqdns., Battle Flt., to Bureau of Aeron. (Jan. 25)

Lucas, 2d Lt. Mason Harley, transferred from Air Corps to Field Artillery; report to Fort Sam Houston, Tex. (Feb. 21)

McKeller, Lt. Earle P., detached VJ Sqdn. 1, Aircraft Sqdns., Battle Flt., to VO Sqdn. 1, Aircraft Sqdns., Battle Flt. (Jan. 31)

Malloy, Lt. Comdr. William E., detached Fuel Oil Testing Plant, Navy Yard, Philadelphia, to c.f.o. *U. S. S. Saratoga.* (Jan. 26)

Malstrom, Lt. (j.g.) detached VO Sqdn. 1, *U. S. S. Tennessee,* Aircraft Sqdns., Battle Flt. (Feb. 9)

Marple, Lt. (j.g.) Matthias M., jr., detached VO Sqdn. 2, *U. S. S. California,* Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 11)

Masters, Lt. James C. (S.C.) desp. orders January 14, 1927, to *U. S. S. Chaumont,* revoked; continue duty Aircraft Sqdns., Battle Fleet. (Jan. 22)

Michael, Lt. Stanley J., detached VO Sqdn. 1, *U. S. S. Colorado,* Aircraft Sqdns., Battle Flt., to Naval Air Sta., Coco Solo, C. Z. (Jan. 26)

Miller, Ens. Harold B., detached VO Sqdn. 2 *U. S. S. Maryland,* Aircraft Sqdns., Battle Flt., to VO Sqdn. 1, Aircraft Sqdns., Battle Flt. (Feb. 19)

Mills, Lt. (j.g.) DeLong, detached VT Sqdn. 1, Aircraft Sqdns., Sctg. Flt., to Nav. Air Sta., Lakehurst, N. J. (Jan. 21)

Mueller, Lt. Comdr. Louis E. (M.C.), detached, *U. S. S. Aroostook,* to Nav. Air Sta., Lakehurst, N. J. (Feb. 8)

Nichol, Ens. Bromfield B., desp. orders December 17, 1926, modified, to Aircraft Sqdns., Sctg. Flt. (Jan. 22)

Owen, Lt. George T., detached VO Sqdn. 3, *U. S. S. Richmond,* Aircraft Sqdns., Sctg. Flt., to VO Sqdn. 3, *U. S. S. Raleigh,* Aircraft Sqdns., Battle Flt. (Feb. 5)

Peck, Lt. (j.g.) Edwin R., orders January 28, 1927, to *U. S. S. California,* revoked; continue duty with VO Sqdn. 2, Aircraft Sqdns., Battle Flt., *U. S. S. Nevada.* (Feb. 10)

Perry, Lt. John, to duty involving flying. (Jan. 21)

Pope, Lt. Loverne A., detached VO Sqdn. 3, *U. S. S. Raleigh,* Aircraft Sqdns., Sctg. Flt., to VO Sqdn. 3, Aircraft Sqdns., Sctg. Flt. (Feb. 11)

Radford, Lt. Arthur W., detached VO Sqdn. *U. S. S. Colorado,* to VO Sqdn. 1, *U. S. S. Pennsylvania,* Aircraft Sqdns., Battle Flt. (Feb. 17)

Ragsdale, Lt. Van Hubert, orders January 8, 1927, to Bureau of Aeron., revoked; continue duty Aircraft Sqdns., Battle Flt. (Jan. 27)

Schur, Lt. Meinrad A., detached VT Sqdn. 2, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 2)

Seitz, Lt. George A., orders January 28, 1927, to VO Sqdn. 2, Aircraft Sqdns., Battle Flt., revoked; continue duty with VO Sqdn. 2, *U. S. S. Nevada,* Aircraft Sqdns., Battle Flt. (Feb. 9)

Sisson, Ens. Thomas U., detached Nav. Air Sta., Pensacola, Fla., to *U. S. S. Henderson.* (Feb. 11)

Spangler, Ens. Solden B., detached VO Sqdn. 2, *U. S. S. New Mexico.* Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 11)

Storrs, Lt. (j.g.) Aaron P., 3d, detached VF Sqdn. 6, Aircraft Sqdns. Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 11)

Swithenback, Lt. Charles E. (S.C.) detached Nav. Air Sta., Pensacola, Fla., to c. f. o., *U. S. S. Sarotoga.* (Feb. 19)

Tague, Lt. James R., detached VO 3, *U. S. S. Cincinnati,* Aircraft Sqdns., Sctg. Flt., to VO Sqdn. 3, Aircraft Sqdns., Sctg. Flt. (Feb. 10)

Thompson, Lt. Walter L. (Ch. C.), detached Nav. Air Sta., San Diego, Calif., to Nav. Sta., Virgin Islands. (Feb. 5)

Truitt, Lt. Comdr. Razzie W. (Ch. C.), detached, *U. S. S. Maryland,* to Nav. Air Sta., San Diego, Calif. (Feb. 4)

Updegraff, Lt. William N., detached Nav. Air Sta., Pensacola, Fla., to Naval Air Station, Canal Zone. (Jan. 26)

Ward, Lt. (j.g.) Frank T., detached VT Sqdn. 2, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 11)

Warman, Lt Jonathan H., detached office Nav. Inspr. of Mach., Am. Brown, Boveri Elec. Corp., Camden, N. J., to c. f. o., *U. S. S. Saratoga.* (Jan. 27)

Whitmore, Lt. Frank R., detached VO Sqdn. 1, *U. S. S. Colorado,* Aircraft Sqdns., Battle Flt. (Feb. 9)

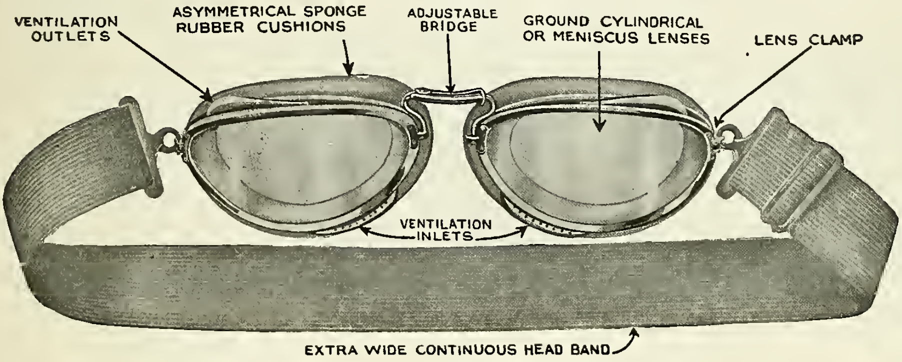
MAJOR H. R. HARMON DETAILED TO LONDON

MAJOR HUBERT R. HARMON, until recent Chief of the Information Division, Office Chief of Air Corps, was detailed as Assistant Military Attache, American Embassy, London, England, relieving Major C. L. Tinker, who has been directed to report to the Chief of Air Corps, Washington, D. C., for duty.

Captain Robert L. Walsh has succeeded Major Harmon as Chief of the Information Division.

MEYROWITZ LUXOR GOGGLES

ORIGINATED AND MANUFACTURED EXCLUSIVELY BY E. B. MEYROWITZ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ASYMMETRICAL SPONGE RUBBER CUSHIONS
ADJUSTABLE BRIDGE
GROUND CYLINDRICAL OR MENISCUS LENSES
LENS CLAMP
VENTILATION INLETS
EXTRA WIDE CONTINUOUS HEAD BAND

NUMBER 6 U. S. AIR SERVICE MODEL

U. S. Air Service Model 6	
With ground polished and cylindrical bent white lenses	$10.75
With ground polished and cylindrical bent amber and euphos (green) tinted lenses	12.75
With hand ground meniscus white lenses	15.00
With hand ground meniscus amber or euphos (green) tinted lenses	16.50

LUXOR Goggles No. 6 (Regular Model)	
With first quality white lenses	$9.75
With first quality tinted amber or euphos (green) lenses	10.50
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With first quality white lenses	$6.75
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THE AERONAUTICAL INDUSTRY

Splitdorf-Bethlehem officials at the annual conference at Newark, N. J.

SPLITDORF CONVENES

DISTRIBUTORS and branch managers of the Splitdorf-Bethlehem Electrical Company gathered from all sections of this country and Canada for the annual conference at Newark, N. J., recently.

In outlining the company's policy for the year, Walter Rautenstrauch, who became president on January 1, emphasized that quality was the primary consideration of the production program with respect to all the company's products.

The conferees pictured here, reading left to right, are L. E. Farine, manager of products service; H. R. Curtiss, general manager of the San Francisco and Los Angeles branches; W. A. Weston, export manager; H. W. School, New England representative; E. A. Kelley, secretary and treasurer; E. L. Hehn, Philadelphia representative; W. C. Keller, general sales department; A. V. Redack, automotive division representative; O. W. Smith, central district manager; E. Nowosielski, chief engineer; G. Ryan, Toronto branch manager; A. E. Laurencelle and F. T. Adler, New York representative; H. A. Haviland, Pittsburgh representative; G. Land, vice-president; Walter Rautenstrauch, president; A. A. Sinclair, radio sales department; W. Greenop, service representative; R. W. Porter, general sales manager; G. V. Sass, New England representative: F. P. Upton, vice-president; H. E. Barnes, radio engineer; S. D. Katz, Atlanta representative; H. A. Wattenscheidt, automotive division representative; S. Schaeffer, advertising department, and F. R. Hartman, general sales department.

ATLANTA AIR NEWS

By Walter B. Ratliff

WITH $25,000 appropriated by the city council as a part of a fund to be raised for lighting Candler Field here and with $300 additional provided for a survey of lighting systems on other fields it now is assured that night flying into Atlanta will be possible in a few months.

Sponsored by W. B. Hartsfield, chairman of the city council's aviation committee and literally the "father of Candler Field," the appropriation was adopted without opposition. Immediately thereafter a resolution was offered to provide $300 for a survey of airport lighting systems and this also was voted. Mr. Hartsfield now is on tour of several important aviation fields to study their lighting systems.

It is anticipated that in addition to the $25,000 provided by the city there will be an appropriation by the federal government to augment the fund in order that the New York to Atlanta air mail route may be available for night flying.

Since requests for bids on the New York to Atlanta air mail route have been asked, the city government of Atlanta and the people generally have become keenly interested in air activities.

One of the local pilots has a concession from the city which is permitting him to construct a hangar at the field which will take care of about half a dozen planes.

The following aviation committee for 1927 has just been appointed by the Mayor of Atlanta: W. B. Hartsfield, chairman; George M. Hope, T. M. Smith, Henderson Hallman and Palmer Blackburn.

TWO TRAVEL AIRS FOR ALASKAN SERVICE

TWO Travel Air planes left Wichita on February 14th for Alaska, by way of Seattle, to be put into regular service by the Anchorage Air Transport Corporation. One is a cabin job, seating four passengers besides the pilot, and the other is a standard three-place open ship. Both will have changeable landing gear, wheels, pontoons or skis.

Accompanying the ships are Alonzo Cope and Jack Laass, both of whom will act as pilots for the owners. The ships will be put into commercial service, passenger-carrying, photography, transporting mail and freight.

Among the specific uses to which these planes will be put are: carrying hunting and fishing parties into the interior where access is otherwise difficult or impossible, bringing out trappers and pelts during the winter season while prices are high, carrying miners in and out of the gold mine districts, emergency transport of doctors or of stricken people in isolated districts, location of fishing trawlers lost or disabled, or put up in out-of-the-way harbors for refuge from storm, locating and reporting catches of salmon in traps, and carrying passengers and baggage between cities in Alaska and Seattle.

A third Travel Air has been ordered by this company, the type to be determined upon arrival of these first two planes, and it is expected by company officials that the service will expand to such a degree that 15 to 18 planes will be required.

Mr. Cope made the trip to the States from Alaska to select the makes of planes to be purchased, and chose Travel Airs.

Pilots Cope and Laass get a "good luck" send off from Walter Beech.

DETROIT AIR NEWS

By FRANK BOGART

THE flight to Miami undertaken February 21 by Carl H. Keller and Edward Metzen, both prominent in contractors' circles here, in a Stinson-Detroiter four-passenger cabin plane, serves to introduce to Detroit and to aviation circles at large a new organization, one which will give to its home city the distinction of having again been first to start something new.

A small group of men interested in one or more of the aircraft enterprises that have been launched here in the past two years has formed a private airplane owners' club, to be known as "The Wise Birds." It will shortly be incorporated under the laws of Michigan as a non-profit organization.

One Stinson-Detroiter has been bought by this group, which already includes such men as Frank V. Blair, president of the Union Trust Company; William B. Stout, Charles B. Bohn, who has many aircraft interests; Newton Skillman and Mr. Keller. Edward S. Evans, the globe circler, and a number of others are announced as prepared to join in a short time. It will be the policy of the club to own and maintain one airplane for each four members. Not an inexpensive proposition, you will say. But therefore one that these men should be given all the more credit for undertaking, having already shown themselves to be unstinting in their support of aircraft projects.

But to get back to the trip that started Thursday. With "Eddie" Stinson and Ray B. Collins, an air service reserve flyer well known as traveling referee on the 1925 and 1926 commercial airplane reliability tours, as pilots, the pair started out to spend 10 days in Florida, combining business errands with recreation.

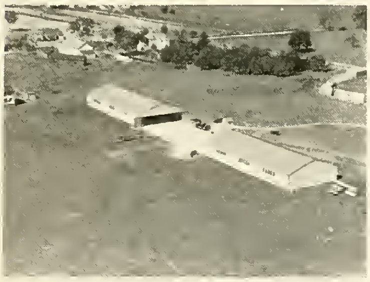
Collins, who is a member of the staff of the Union Trust Company, has been loaned by Mr. Blair to "The Wise Birds" to serve as manager of the club, just as he has in the past been loaned to assist in the reliability tours and in the launching of the Northwest Airways, Inc. (Contract Air Mail Route No. 9, Chicago to Twin Cities) last fall.

Upon the judgment and skill of Stinson and Collins will depend the decision as to whether the plane shall undertake a non-stop hop from Miami to Detroit on the homeward flight. If weather is favorable it will be attempted and may prove to be the accomplishment of the long hoped for dawn-to-dusk, Lake to Gulf flight.

Lieut. Charles D. Williams, U. S. N. R., an engineer on the staff of the Aircraft Development Corporation, president of the Flying Club and commander of the Naval Reserve Seaplane Squadron VT-31, which was located here after considerable effort had been expended by Commander R. Thornton Brodhead and others, has left for Great Lakes, Ill., to bring back the squadron's first training plane. The city has just completed the first unit of hangars for the squadron at Memorial Park. This is hoped to be the nucleus of seaplane activity which will attract great attention to the Detroit River area. The only private owner of a seaplane in this vicinity is Paul Strausburg, who has just built a new boat with an all-metal hull.

William E. Boeing, native of Detroit, but now chairman of the board of the Boeing Aircraft Company of Seattle, which has long been supplying machines to the Army and Navy and has been awarded the contract to carry the western half of the transcontinental mail from Chicago to San Francisco, was a recent Detroit visitor. He went all through the Packard Motor Car Company's aircraft engine shops. Boeing made what many considered a phenomenally low bid for handling the air mail and will have 20 of his latest mail planes ready to start service July 1.

After being shunted around from pillar to post, the 107th Observation Squadron, air unit of the Michigan National Guard, has been told it may erect its hangars, for which the city made an appropriation, in River Rouge Park, out West Warren Avenue. Spring may see this accomplished.



PITCAIRN AWARDED N. Y.-ATLANTA ROUTE

THE Pitcairn Aviation Company, of Philadelphia, Pa., was the only bidder on the proposed New York to Atlanta commercial air mail route, via Washington, Richmond and Greensboro. The distance each way is approximately 773 miles. The company agrees to carry the mails for $3 a pound, including equipment. It will furnish 6 planes and have 11 additional planes available as an emergency reserve.

Flying over this route will be done entirely at night. The tentative schedule arranged provides that the plane shall depart from New York at 9 p. m. each evening, reaching Atlanta at 6 a. m. the next morning. The Department of Commerce has informed the Post Office Department that this proposed route will be lighted just as soon as the appropriation for the purpose is made available.

COLUMBUS AERO CLUB

THE Aero Club of Columbus should be congratulated for the many worth while enterprises it has successfully completed. The club is responsible for the establishment of Norton Aviation Field in Columbus, and for the extension of the mail service to their city. Through their activities an active air unit, the 308th Observation Squadron, was organized, and a bid has been made for the allocation of a proposed National Guard Air Squadron at Columbus. Many flying events have been held at Norton Field under their auspices which have done much to awaken the interest of the community in aviation. The Aero Club discouraged dangerous stunt flying over the city and strongly backed the recent air regulation.

A beautiful club house and aviation center at Norton Field was opened by them in August, 1926. It is dedicated and maintained for the promotion of local and national aeronautic activities. The rooms are artistically and comfortably fitted up for the accommodation of visiting pilots and transient airway passengers and for use by members for social functions.

The government has over $200,000 invested in hangars, planes and lighting equipment at the field, which is a regular stop on the Army Model Airway.

The Aero Club of Columbus' club house and aviation center, and Government hangars (top) at Norton Field.

THE SPARTAN C-3

AN airplane in which safety, both aerodynamical and structural, is the paramount feature has been built and flight tested by the Mid-Continent Aircraft Co., at Tulsa, Okla. The rugged enduring character of the plane suggested the name "Spartan", and its adaptability for commercial use led to the designation C-3, or commercial three-seater, as descriptive of the type.

From an aerodynamical standpoint, the plane was designed so that it would not stall and in the flight tests it demonstrated unusual non-stalling characteristics. Some 30 well known pilots who have flown the ship were unable to make it spin, with motor on or off.

The ship showed no tendency to slip off on one wing, from any position, when all flying speed had been lost. Instead, as it nears a stall, the nose settles and the ship moves forward in a safe glide.

The Spartan C-3 is of the conventional biplane type, with seats for two passengers in front, and the pilot's seat behind. The experimental ship was equipped with a Super-Rhone 120 h.p. radial motor and in flight developed a speed of 110 miles per hour. Other models are being built with a Wright E-2 motor, and later ships will be built to take a Wright J-5 radial, or the model A and I water cooled Wright motors. The estimated speed of the Spartan with the Wright E-2 motor is 125 miles per hour. Landing speed on the Wright motored models is from 39 to 40 miles per hour. With the Super-Rhone, the landing speed was 35 m.p.h.

The remarkable non-stalling feature of the Spartan is attained by a proper positioning of the center of gravity with reference to the mean aerodynamic chord. This static stability is constant for all loading conditions, since all the disposable load has been grouped at the center of gravity. Thus the ship does not get nose-heavy or tail-heavy as in types of planes where the passengers are balanced off against the gasoline load.

Being trimmed at normal cruising speed, the ship therefore in a dive or in a climb, has a positive tendency to return to its normal trimmed speed if the pilot takes his hands from the controls. This quality has been demonstrated time and again in the recent 2,000 mile tour of the ship by flying at both low and medium altitudes, both loaded and light, with the pilot's hands raised clear of the cockpit.

Such pilots as E. P. Lott, Dorsey Askew and Pilot Grogan of the National Air Transport; Ross Arnold and A. R. Lawrence, winners of second and third places in the on-to-Philadelphia race; T. O. Hardin, manager of Good and Foster Aerial Service of Dallas; D. A. McIntyre, owner of McIntyre Airport at Tulsa; and I. A. Woodring, member 1st Pursuit Group at Mt. Clemens, Mich., have enthusiastically praised the performance of the Spartan after flying it themselves. The ship was flown on its demonstration tour by Paul H. Meng, former army pilot, who supervised construction of the experimental model, and is now in charge of production and is also chief test pilot.

Structurally, the ship meets all requirements for Class I airplanes as prescribed by the aeronautical division, Department of Commerce. Complete stress analysis has been made on all parts, using the load factors designated for Class I airplanes, and the Spartan should therefore be eligible for registry for interstate transport.

Medium carbon steel tubing, army specification, is utilized for the fuselage construction. The structure is a modified Warren truss, rigidly braced with steel tubing, no wires being employed. All tubing is flushed inside with a compound to prevent corrosion. Spar varnish is used outside.

The engine mounting is detachable, neatly cowled in good streamline shape with aluminum, which is also used as covering around the roomy cockpits. Doped fabric covering is used on the rest of the fuselage.

Both interplane and landing gear struts are of streamline steel tubing. Flying and landing wires are streamline tie rods.

Gravity feed to the carburetor is attained in the fuel system by use of a small tank in the center section, to which gasoline is pumped from the main tank located under the fuselage. The overflow from the gravity tank is constantly visible to the pilot.

Side view of the Spartan C3.

When the overflow ceases the gravity tank acts as an emergency tank and provides about 45 minutes flying in case of pump failure. The main tank's location permits easy filling and repairing. It holds gasoline for five hours' flying.

Comfort for pilot and passengers is insured by the luxuriously upholstered cockpits, well protected by ample wind shields. A luggage compartment of sufficient size to hold two suitcases is provided under the passengers' seat. Additional space for light articles is provided in the cowling.

The Spartan Commercial 3-seater powered with a Super Rhone.

Detailed specifications and the manufacturer's figures for performance follow:

Span, both wings	32 feet
Length (with radial motor)	23 ft. 6 in.
Height	8 ft. 9 in.
Incidence	Zero degrees
Weight empty (radial engine)	1,225 pounds
Useful load	800 pounds
Total weight loaded	2,025 pounds
Wing loading	7.07 lb. per sq. ft.
Power loading (radial)	16.8 lbs. per h.p.
Wing loading (E-2)	7.65 lbs. per sq. ft.
Power loading (E-2)	12.57 lbs. per h.p.
High speed (120 h.p.)	110 m.p.h.
Landing speed (radial 120 h.p.)	35 m.p.h.
Maximum speed (Wright E-2)	125 m.p.h.
Landing speed (Wright E-2)	39 m.p.h.
Cruising range	500 miles
Climbing speed (Wright E-2)	1,000 ft. p.m.

The Mid-Continent Aircraft Company's Spartan C-3 has a speed range of 35-110 m.p.h.

PERFECT VISION
COMPLETE PROTECTION
UTMOST COMFORT

GET THESE BY WEARING

PROTECTOR
GOGGLE

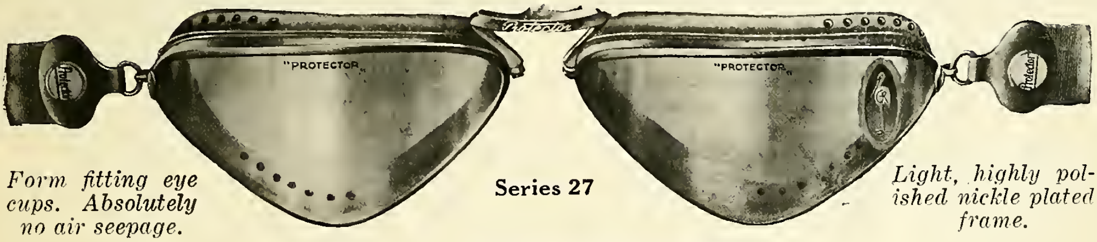
Extra wide head band, finest quality elastic

Patented ventilation prevents dust and fogging

Adjustable bridge, positive lock cannot get loose

Extra quality cylindrical lenses

Large rubber cushions —extra soft



Form fitting eye cups. Absolutely no air seepage.

Series 27

Light, highly polished nickle plated frame.

(Can be had also in solid silver, $20.)

Regular Model

$7.50

including genuine leather case

Worn and recommended by leading military and commercial aviators

Junior Model

$3.50

in light metal carrying case

We want a dealer on every flying field; write for proposition

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Address all telegrams "via Westbury"

Next to
Curtiss Field

GORDON BENNETT AND NAT'L BALLOON RACES

THE Gordon Bennett balloon races are to be held in the United States between July 1 and September 15, 1927. The entries must be made before May 1.

The Navy will be entered in the National Balloon Race at Akron, Ohio, in May, the elimination race which will determine the American representatives in the International Gordon Bennett race. Lieut. Commander M. R. Pierce, U. S. N., has been chosen as the commanding officer of the unit from the Navy. Lieut. Charles E. Bauch is executive officer. The 1926 Gordon Bennett balloon race, which was held in Brussels, Belgium, was won by Van Orman, of Akron, Ohio, representing the Akron Flying Club.

RADIO SETS BY AIR

WHEN the Crosley Radio Corporation of Cincinnati wanted to deliver some merchandise in a hurry to Columbus and Indianapolis recently two Waco airplanes were pressed into use. These planes were furnished by the Embry-Riddle Company of Cincinnati, operating Lunken Airport, and were piloted by Lieuts. J. Paul Riddle and Stanley Huffman.

The Crosley distributors at Columbus and Indianapolis were holding dealers' meetings and were clamoring for new Crosley models that were just going into production. The day of the meetings arrived and they had not received their sets. Powel Crosley, Jr., president of the Crosley factory, immediately ordered them to be sent by air.

The first sets were snatched from the production tables after the final test and were rushed by motor car to Lunken Airport, where Huffman and Riddle were tuning up their Waco planes. The merchandise was stowed into the cockpits of the two machines and the pilots took off from the field in a dense fog, Riddle steering toward Columbus and Huffman toward Indianapolis. Lieutenant Riddle broke the flying record between Cincinnati and Columbus despite the threatening weather.

T. Higbee Embry, president of the Embry-Riddle Company, is enthusiastic over the attitude of such industrial leaders as Powel Crosley, Jr., toward using airplanes for fast transportation.

Allison high lift wings on J1 airplane.

HIGH LIFT WINGS

THE Standard J-1 equipped with Allison "high lift" wings, owned by Joe Shalz, was flown the 400 miles between Lawrence (where the wings were built) and the owners home in Brewster, Kansas, in five hours. Only 45 gallons of gasoline were consumed. The regular Standard model requires 60 gallons of gasoline and takes 7 hours to make the same trip.

Wings were built to give the correct balance when pinned to the regular fuselage and center-section fittings, requiring no changes to wiring and fittings. The fuselage was shortened 26 inches. The wing spread is 32 feet instead of the original 44 feet; the chord is 5 feet 3 inches instead of 6 feet. The weight of the new high lift wings with struts and wires is 100 pounds less than the weight of the original J-1 wings and rigging.

With pilot alone, the plane flies level when the stick is released. With two passengers it has a tendency to nose up slightly; with the engine cut the ship noses down normally.

NEW AIRPLANE ENGINE

LEIGH WADE, round-the-world flyer, will be associated with Otto Herman, president of the Century Rotary Motors Corporation of New York, in manufacturing a radically new type of internal combustion rotary engine for airplane and marine use.

The Century Corporation has just purchased the former Marvin and Cas'er plant at Canastota, N. Y., where the engine will be produced.

The motor is the invention of Otto Herman, a Hungarian engineer and flyer who has spent more than seventeen years in developing the principle involved in this new engine. He built the first motor of this type a number of years ago.

Flying an emergency shipment of radio sets from Lunken Airport.

FIRST AIRPLANE TIRE WITH NON-SKID TREAD

THE first airplane tire bearing a non-skid tread has been announced by The Goodyear Tire & Rubber Company of Akron, Ohio, manufacturers of airplane tire equipment since 1905.

The latest Goodyear aeronautical tire is available in the 20 by 4 size for light planes and was designed and put into production in response to a steadily increasing number of requests for the size from plane manufacturers and owners of small ships in various parts of the country. The manufacturers believe that the new type tire will be a factor of importance to airplane builders, particularly where brakes are employed on the landing chassis.

The new tire is the smallest standard size ever made in the Goodyear factories for airplanes, the rest of the line ranging in size to the 54 by 12 size used on the largest airplanes.

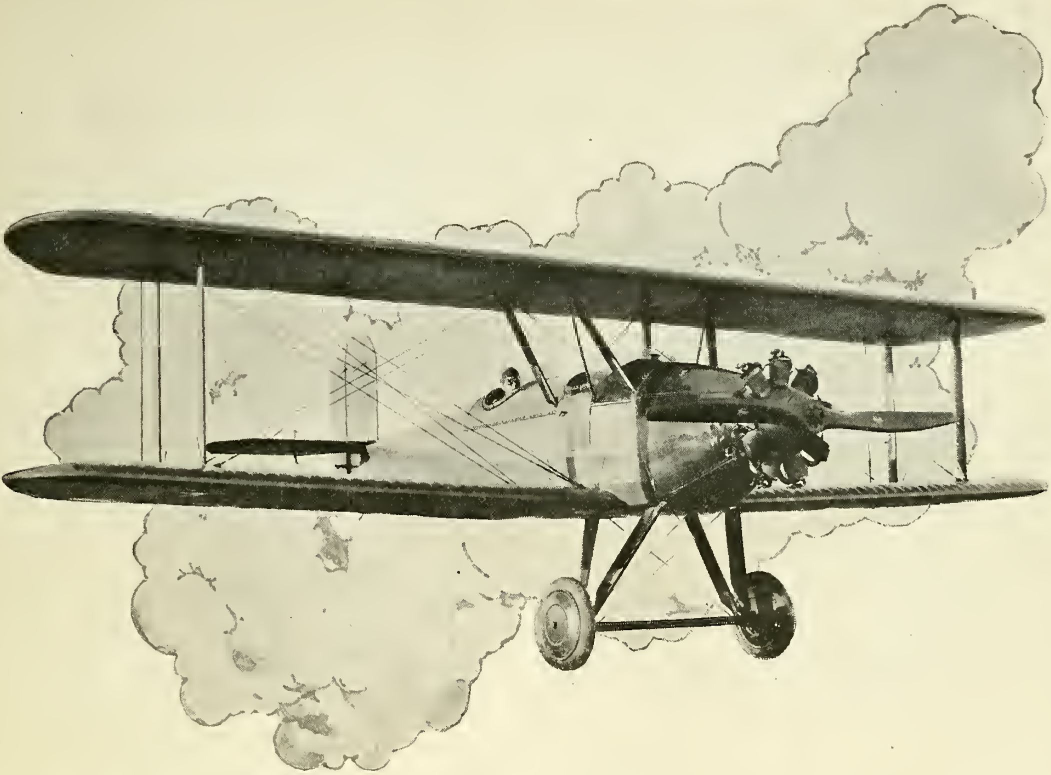
FIRST INSPECTION OF AN OPERATING CO.

THE New Federal Air Regulations Act actually went into practice February 1st when Major Clarence M. Young, Chief of the Division, and his corps of inspectors arrived in Philadelphia to inspect and test the equipment, pilots and mechanics of the Ludington, Philadelphia, Flying Service preparatory to issuing the proper licenses. Major Young was accompanied by the following assistants: Ralph G. Lockwood, supervising inspector; John R. Hosch, aeronautical engineer; Frank H. Jerdone, experimental pilot; Robert H. Gast, Parker D. Cramer, W. R. Jones, C. I. Stanton and W. N. Breigan, inspectors.

The first of the Ludington fleet to be inspected at the Philadelphia Municipal Flying Field was "Nize Baby", the winner of the Aero Club of Pennsylvania Trophy, now used as a speedy cross-country ship. Bob Hewitt, chief pilot, and "Wally" Hope, assistant pilot, then completed their flight examinations for transport pilot licenses. The inspection party then went to the Pine Valley Field, some by plane and some by automobile, where the rest of the Ludington ships were inspected and flight tested, and other local pilots and planes were examined.

The following day the pilots and mechanics were given a written examination in airplane construction, rigging, engine mechanics, and meteorology, all of which must be passed to comply with the Department of Commerce regulations for a license.

Major Young and his assistants are taking a very constructive attitude towards the regulating of commercial aviation. It was feared by some that to regulate would be to retard progress, but it certainly appears that the desire of the Department as carried out by Major Young is to help this struggling industry by keeping it healthy and safe and gaining the public confidence by safeguarding their interests as well as those whose heart and soul, to say nothing of their money, is invested in aviation.



SPARTAN C-3

Commercial Three-Seater

FOR those who want SAFETY as the first requisite of an airplane and who also desire rugged endurance, reliability, comfort, beauty of design, economy of operation, low upkeep and efficient performance, we have made this airplane.

Its nonstalling characteristic under the most severe flight conditions, insures the safety of pilot and passengers, despite possible human errors in piloting.

Its performance sets a new mark in the three-seater class, and in attaining its high standard of comfort and beauty nothing has been sacrificed of structural strength or aerodynamic quality.

Designed and built in accordance with Department of Commerce Regulations for Class I Airplanes.

For details and dealer territory write

MID-CONTINENT AIRCRAFT COMPANY

TULSA, OKLAHOMA

CONTINENTAL MOTORS CORP'N BUILDS NEW AVIATION ENGINE

THE single sleeve valve airplane engine introduced for the first time at both the New York and Chicago Automobile shows is the first of its kind to be seen in this country.

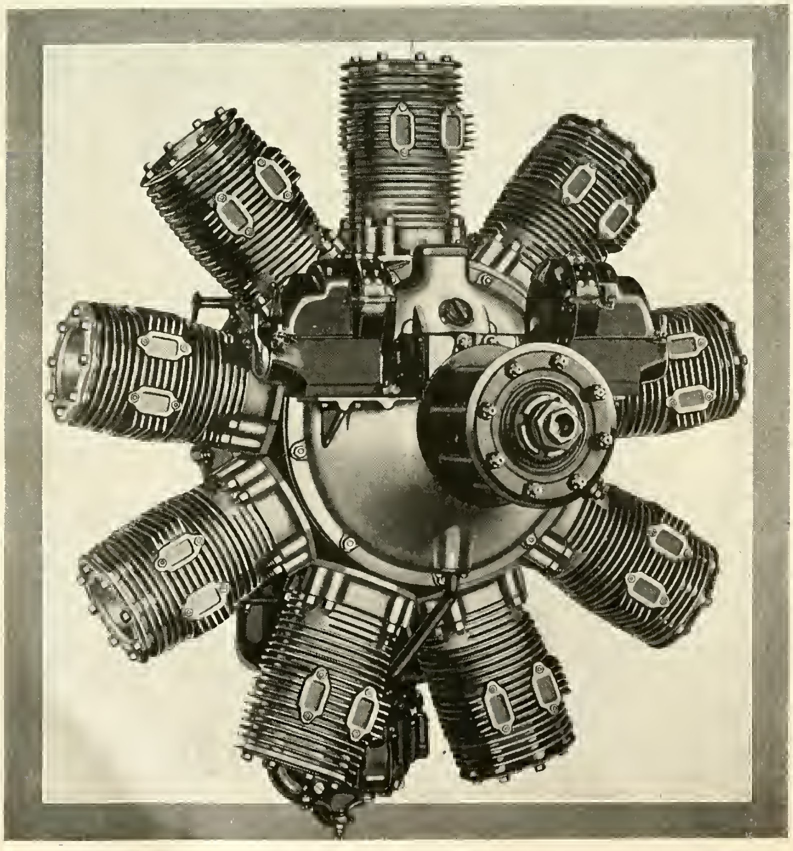
The engine is a nine cylinder, radial air cooled type with 4½ inch bore and 5½ inch stroke, developing 220 horse power at 1,800 revolutions per minute. The engine has a displacement of 787.25 cubic inches and weighs 475 pounds.

This is the same type of engine the use of which the Aeronautical Research Committee has recommended to the State Department of the British Government.

The single sleeve engine as developed by the Continental Motors Corporation is only one of a series of such engines it is intending to design before it will be ready for production.

The absence of poppet type valves results in an elimination of a great number of working parts and vibration is cut down considerably. Spark plugs are located at the cylinder head in the position normally occupied by inlet and exhaust valves in the ordinary engine. Twin Scintilla magnetos are mounted on a transverse shaft in front of the crankcase. The crankcase has a built in supercharger.

While the Continental single sleeve motor is new in principle and never has been in an American-made motor car, it is not an experiment, for it had its origin in 1909 in Alexandria, Scotland, being the creation of two eminent Scottish engineers, Peter Burt and Harry McCollum. When the world's patents for this motor were purchased by the Continental Motors Corporation in 1925, the name of it was changed from Argyll to Continental single sleeve.



Propeller end of the 220 horse power Continental sleeve-valve aircraft engine.

AERO CLUB OF PENNA.

THE Aero Club of Pennsylvania held its annual meeting at the Engineers Club, in Philadelphia, and the following officers and directors were elected for the ensuing year: president, R. Sanford Saltus, Jr.; 1st vice-pres., Hollinshead N. Taylor; 2nd vice-pres., C. T. Ludington; treasurer, William Sheahan; secretary, Roy G. Miller. Directors: Harold F. Pitcairn, Thomas E. Eldridge, J. V. Dallin, Robert P. Hewitt, W. Wallace Kellett, Joseph A. Steinmetz, Thornton D. Hooper and C. B. Graham.

It was announced that a club house had been placed at the disposal of the members on the Philadelphia Municipal Flying Field by Ludington Philadelphia Flying Service.

It was planned to hold an air meet on the Municipal Field in the spring at the official opening of the field. This meet will be held under the auspices of the Aero Club and directed by the Ludington Philadelphia Flying Service in coöperation with the National Guard of Pennsylvania.

ASPA'S PLANS FOR 1927

By Thomas L. Hill

President, The American Society for Promotion of Aviation

WITH a background of three years of voluntary service in the cause of aviation, during which time its membership has grown from twelve to over two thousand members, the ASPA faces 1927 with high hopes of helping to make America's air supremacy one of fact.

In 1917, a few hundred Americans were sent to Canada and attached to the R.F.C. for flying training. In the R.F.C. at that time were hundreds of American boys. Friendships were formed which have been continued by the means of a yearly banquet held in New York City. From this group and from ex-Army and Navy Air Service pilots and enlisted men, coupled with commercial airmen and civilians interest in the development of aviation, the ASPA has grown. They were organized to: arouse and maintain interest in aviation as our strongest arm of National Defense; to achieve this work through educational methods; to work for a landing field of airport in every town; to work for coördination of air activities.

Their organization plans call for a National headquarters, State squadrons and Local flights, thus keeping a skeleton of the Air Service military organization. It is their hope that ultimately every flight organized will develop into a full fledged flying club through which the boys of its community will be trained as competent airmen. If these hopes are realized, the day is not far distant when the government will have available thousands of young airmen ready for service if wanted.

In the past two years their members have done splendid work. They have secured landing fields. They have given talks over the radio, before boy's clubs and before school assemblies. Over a hundred members have associate with the Boy Scout Troops in their vicinity, in the capacity of aviation advisers.

BOSTON AIRPORT NEWS

By G. W. Hamblin, Jr.

WITH the usual buckets of flaming gasoline on the runways for night flying equipment, B. F. Billings, chief pilot of the Boston Airport Corp., made two flights during the week of February 7 for the Metropolitan Theatre.

Four new students have been added to the roster of the Airport Corp. They are: J. F. De Natelli, Mike Harlow, William Byrd, cousin of Commander Richard E. Byrd, and Z. D. Granville.

Lieut. R. L. O'Brien, one of the State Aviation Inspectors, checked out four graduates of the Flying School during the month. The four newly-made flyers are: John Rosecrans, "Red" Spaulding, Crocker Snow, and Clarence B. White.

C. B. White is on his way to Kansas with Edward Murray in the latter's Travel Air, which was purchased from Billings. Whitey is giving his boss, Murray, flying instructions on the way, thereby saving a lot of time. White will return in July.

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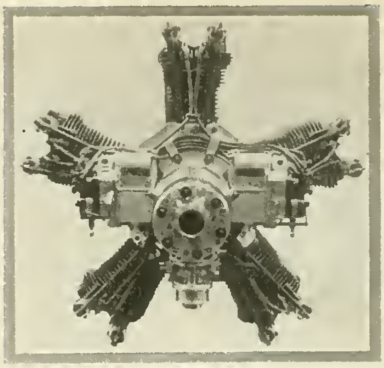
ARMSTRONG SIDDELEY 65 H. P. GENET ENGINE

THE Genet is the latest and smallest of the well known Armstrong Siddeley series of static radial air-cooled aero engines, its general design following that of the Jaguar and of the Lynx, and incorporating all that extended experience in the production of these engines has shown to be of value. It is a product of the Armstrong Siddeley Motors, Ltd., of Coventry, England.

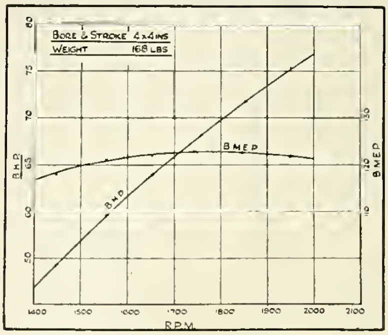
While built primarily to compete in last year's light airplane competitions in Great Britain, the Genet has been developed on lines that will allow it to be produced on a commercial basis for use on light planes generally. It scores on the grounds of accessibility, simplicity, and ease of maintenance—three vital qualities as far as the owner-pilot is concerned. The radial arrangement also is particularly convenient when adjustments of dismantling become necessary.

The engine has five air-cooled cylinders which are arranged radially. The bore and stroke are 4 by 4 inches. Its normal revolutions are 1,850 per minute, at which speed it develops 65 h.p. When speeding up to its maximum of 2,035 r.p.m., 75 h.p. are obtainable with a standard compression ratio at 5.2 to 1. The fuel consumption at the rated h.p. is .575 pints per b.h.p. hour and the oil consumption .03 pint per b.h.p. hour. The unit complete with one magneto, carburetor, air-intake, short exhaust pipes, propeller boss, and speedometer drive scales is 168 lbs. Its overall cylinder diameter and length are respectively 32.6 and 30.1 inches.

The five steel cylinders are screwed into steel adaptors located in the aluminum crankcase where they are locked with a double cone lock ring. The aluminum alloy semi-spherical heads are shrunk, screwed and lockringed on to the cylinders, the valve seats and plug bosses also being shrunk in. There are two inclined overhead valves per cylinder, the exhaust being made of cobalt chrome, and the inlet of stainless steel. Duplex valve springs and tubular steel push rods are operated by roller ended tappets, the latter being driven by a slow-speed camshaft worked from the crankcase through the medium of two epicyclic gears. The crankshaft runs on ball bearings, the front main bearing taking the propeller thrust, while the propeller journal loads are taken by a plain bearing contained in the front cover which also serves as an oil retainer for the oil on its way from the pump to the crankshaft.



The Armstrong Siddeley "Genet" engine.



Power curves of the Armstrong Siddeley 65 h.p. "Genet" aircraft engine.

The master rod is made in one piece. Master ring and the auxiliary rods are of H section. The Y alloy forged pistons are fitted with two rings and a scraper ring above the floating gudgeon pin, and one scraper ring below it. Ignition is provided by accessibly placed B.T.H. magnetos driven by bevel gears from the crankshaft. The mixture is controlled by a Zenith carburetor, a mixing fan being provided in the induction system as on other Armstrong Siddeley aero engines. The lubrication relies on the dry pump system, the pump unit incorporating the pressure and scavenge pumps.

WISCONSIN AIR NEWS

A CHOICE landing field situated about a mile from the Superior post office and adjoined by a good highway is under survey by the Superior Public Affairs committee as a terminal for air mail planes and passenger planes which will begin flights between Superior and St. Paul in the spring with the extension of the Northwest Airways, Inc.

The announcement of the Superior service was made recently by Col. L. H. Britten, vice-president Northwest Airways, now running between the Twin Cities and Chicago. This would make Superior the leading airport of the northwest and the only one at the head of the Great Lakes. From all indications the air mail service going out of Superior will serve not only all of the upper Wisconsin but many cities in Minnesota, including Duluth and the Iron Range cities, and towns and cities in North Dakota and Montana.

A Milwaukee branch of the Chicago Aeronautical Service, Inc., is to be opened soon. A complete course in aeronautics will be offered by the company. Edgar E. La Parle, chief pilot and holder of several race records, will be in charge of the flying instruction while the theoretical and ground work will be under the supervision of John Miller, former chief instructor for the U. S. A. C. at Chanute Field, Ill. The Milwaukee branch will also engage in aerial advertising. John M. Lang, an aerial photographer, is to be in charge of the Milwaukee office.

With plans already under way for the organization of a Milwaukee chapter of the U. S. Air Force Association, announcement was made recently by Col. J. Edward Cassidy, director general, that a local representative of the association will be appointed to complete the details.

The new chapter, which will be a unit of the largest organization of the World War and other flyers in the United States, will be comprised of fliers and ex-fliers as well as the leading business men of the city. Among the business men already enrolled are: Carl Herfeld, chairman of the Citizens Airport committee; Postmaster Peter Piasecki, George A. Hoehn, secretary of the Association of Commerce and Mayor Daniel Hoan.

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Effective March 8th, 1927

The Company announces a progressive manufacturing production of the following standard types that have been identified with the former name:

PETREL —An ideal commercial 3-passenger biplane; useful load 1200 pounds.
PUFFER —The premier commercial cotton dusting airplane.
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PEGASUS —Fast single engined light bombardment plane.
PIRATE —Twin engined light bombing or transport plane.
CYCLOPS —The largest single engined bomber in America.

See further announcements for other types now under development

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With proper handling, you may expect the same of *your* Travel Air.

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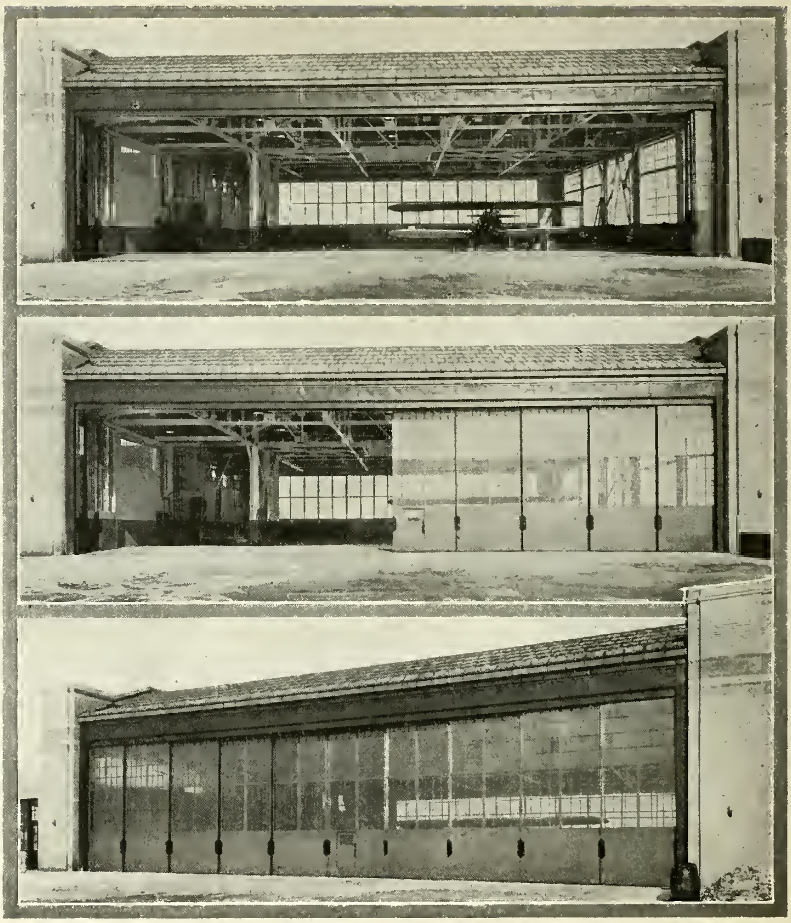
ALPINE CHASSEURS HONOR C. E. THOMPSON

EUROPEAN recognition was given the part played by an American citizen in aeronautical and automotive progress when C. E. Thompson, valve manufacturer, was made an honorary officer of the 22nd Battalion of Alpine Chasseurs last month during the annual festival at Nice, France. The honorary commission is one of two conferred by the battalion, known during the war as the "Blue Devils," the other going to King Ferdinand of Roumania.

Mr. Thompson, head of Thompson Products, Inc., with plants in Cleveland and Detroit, has been a leading figure in the automobile industry for twenty-five years. He became interested in aeronautical development during the world war. He sponsored extensive research work in the improvement of valves and other engine parts which have since been adopted by many American and European aeronautical and automobile manufacturers.



The new Ford hangar at Lansing, Illinois, with doors in various positions.

TRUSCON DEVELOPS STEEL HANGAR DOORS

ONE of the interesting features of the Ford Airport recently established at Lansing, Illinois, is a copper-alloy steel hangar door made by the Truscon Steel Co.

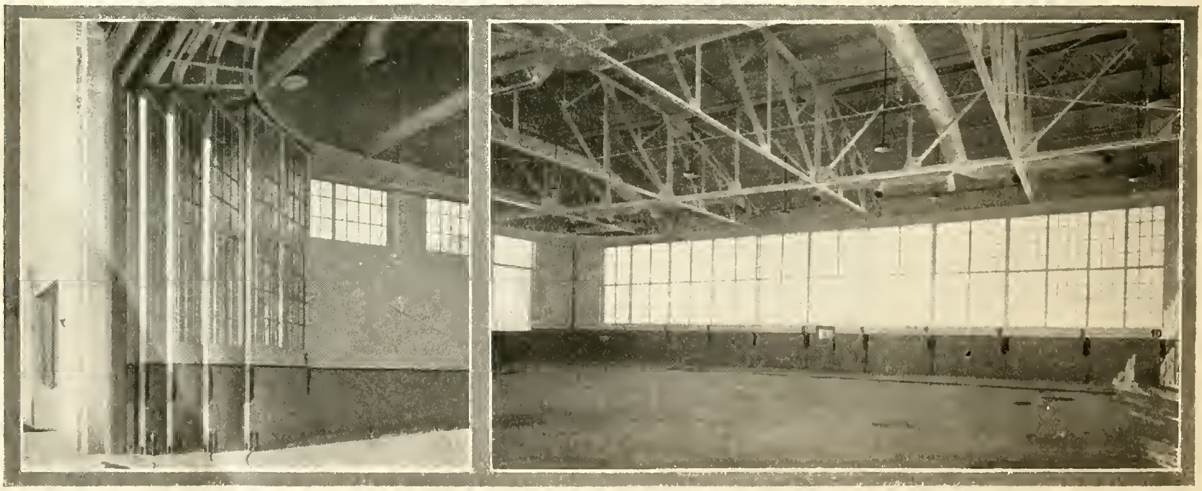
The doors as installed in the Ford hangar are made in sections of ten units of "screens", which roll on separate tracks to either side of the center line of the hangar and stack up against the side walls. Their seamless tubular rail construction combines strength and rigidity with light weight and makes the doors self supporting. They operate on ground wheels running on a track embedded in the floor instead of having to be hung from the super-structure. Overhead channels merely guide the doors in their route. Economy in the design of the roof structure follows the use of these doors since it is not necessary to provide for the weight of the doors as must be done when overhead roller doors are used.

The wheels on which these new doors operate are of roller-and-ball-bearing construction and the doors coast into and out of place with the utmost ease.

Albert Kahn, Incorporated, of Detroit, architects and engineers on the new hangar, have pointed out several significant points of the door with relation to the hangar.

"The building itself may be any depth," said Mr. Kahn, whose interest in Detroit aviation is well known, "and the steel doors may be made to fit any width of hangar opening by adding more sections. We can thus equip a hangar for huge bombers or airliners or supply a similar design, on scale, for a small ship.

"The hangars at Lansing are laid out in clear spans. Not a single column is required inside the hangars for supporting the roof."



Interior details of the Ford hangar, showing the tracks and guide rails for doors and the unobstructed floor space.

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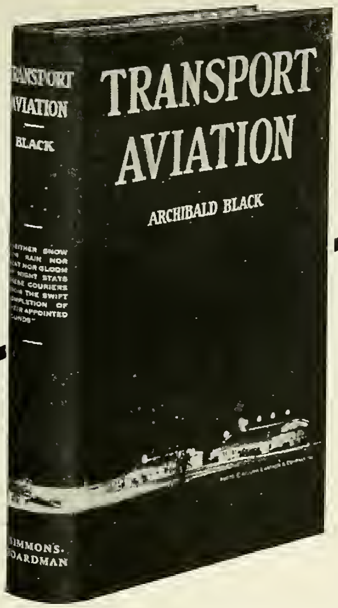

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"Mr. Black's book in its comprehensiveness and clarity has a definite excuse for being."—*New York Herald-Tribune.*

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WILL ROGERS AIR TOURS FLORIDA

WILL ROGERS, self-appointed diplomat and aviation enthusiast, left the ranks of "those Americans who have traveled over European airlines but failed to patronize the at-home commercial air service" recently during his annual February tour of Florida.

Arriving on the west coast of Florida where he was scheduled to make a number of appearances, the aerial-lariat tosser found that the trail of steel was too slow for the engagements his advance man had made. Consequently on his arrival in St. Petersburg he phoned Major Reed M. Chambers of the Florida Airways Corporation and soon had a plane at his disposal.

Aboard the Airways' flagship, a Curtiss Lark plane, Mr. Rogers became passenger No. 1152 of C. A. M. No. 10. Under the pilotage of J. N. Kelly he visited the state capitol, Tallahassee, returning to Tampa and Sarasota the following day.

During a period of forty-five days, the traffic department of the Florida Airways corporation at Tampa, Florida, reported a paid passenger list of 213 persons.

In addition to the passenger carrying, the Airways has opened municipal airports at Sarasota and Dade City, both cities being located on the regular charted air mail route. Plans are now being completed to formally open the $50,000 airport of Jacksonville located seven miles to the north of the city adjacent to the main north and south highway and railroad.

SCHENECTADY AIRPORT

COLONIAL AIR TRANSPORT, INC., has purchased 165 acres of land at Schenectady, N. Y., at an outlay of $90,000, for the purpose of establishing a major airport. Laying out of the port will involve an expenditure in excess of $500,000 during the next five years.

The airport will constitute an important connection between the New York-Montreal and the Boston-Chicago airlines, which the Colonial Air Transport plan to operate this summer.

Major Scott Button, commercial engineer in the lighting department of the General Electric Company and chairman of the chamber of commerce aviation committee, has worked untiringly to place Schenectady on the air map, and to secure this air center for the city. Others on the chamber of commerce committee who worked with him were: H. C. Ritchie, head of the General Electric department on landing-field illumination; James C. McDonald, M. C. Fitzgerald and Carl W. Snyder.

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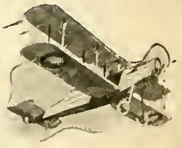

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CONCORD, N. H., AIRPORT

ONE of the finest airports in New England has just been completed at Concord, N. H. The field, comprising one hundred acres, is located one mile east of Concord. The land is owned by the State, which appropriated the funds necessary for the clearing and smoothing of the runways.

The runways are L shaped, 2,300 feet by 300 feet north and south and 1,775 feet by 300 feet east and west. The north-south runway adjoins the old flying field, giving a total clear runway of 4,000 feet into the prevailing wind. A corrugated iron hangar, 50 feet by 60 feet including shop space of 50 feet by 15 feet, has been completed.

The hangar is owned and the field operated by the Concord Airport Corporation composed of leading business men headed by Robert Jackson, prominent lawyer and aviation enthusiast. The hangar has been leased and will be operated by Lieut. R. S. Fogg, who has been engaged in commercial flying for the past eight years, operating land planes as well as a mail-carrying flying boat on Lake Winnipesaukee, N. H.

NEW SUPPLY CATALOGS

THE Nicholas-Beazley Airplane Company of Marshall, Mo., have received the first ten thousand copies of their new supply catalogs for free distribution upon request.

The catalog contains 100 pages, with over 100 cuts and illustrations, covering every part of the OX5, OXX6 and Hispano Suiza engines, also all popular magnetos and carburetors by part number, description and price for the convenience of buyers.

Through many years of experience the Nicholas-Beazley Airplane Company has noticed that many men have considerable difficulty in ordering due to the many details that must be described to insure getting the correct part. The illustrated catalog is planned to simplify ordering, to save time in filling the orders and to eliminate all chance of sending incorrect parts.

DRIGGS AIRCRAFT CO. FORMED IN LANSING

LANSING has always shared in the tribute paid Michigan as the automotive center of the world. The Driggs Aircraft Corporation of Lansing, Michigan, capitalized for $100,000, and recently incorporated under the laws of the state of Michigan, now gives Lansing a share in the development in commercial aviation.

Ivan H. Driggs, formerly of Lansing, but for many years connected with aviation activities in Dayton, Ohio, is moving his plant here from the former city.

The officers of the new firm are: president, Harry F. Harper, (president and general manager, Motor Wheel Corporation); vice-president and general manager, Ivan H. Driggs; secretary, E. C. Shields, Lansing attorney; treasurer, Hugo B. Lundberg (vice-president and general manager, Michigan Screw Co.). These officers, together with the following Lansing men, make up the board of directors: R. E. Olds, Donald Bates, Ray Pottery, J. T. Hopkins and H. T. Thomas.

BUFFALO AIRPORT

By Notso

MAJOR T. G. LANPHIER, C. O., of the First Pursuit Group, Selfridge Field, and eight of his crack pilots stopped in Buffalo over January 29 and 30 on their way back from Montreal where the group went on a "Good Will" mission. Owing to the fact that the planes were equipped with skis and Buffalo Airport was clear of snow it was necessary for the flight to land on the ice in the outer harbor. The airport set up a temporary organization at the harbor and serviced the planes there. Major Lanphier sent a letter of thanks to all concerned upon his return home.

Lieut. F. C. Crowley, one of the "Good Will" pilots, returned to Buffalo en route to New York, had a little hard luck on arrival here and remained for almost a week before he shoved off for New York on February 10. A DH flown by Cadet Hoovey of Selfridge brought him a wheel on the latter date.

Recently the secretaries of the New York State Chambers of Commerce in convention here inspected this airport and as a result went on record in formal meeting to support commercial aviation in every way possible.

Nathaniel E. Duffy has been appointed Superintendent of Operations at this airport effective February 1. The same date Charles (Dolly) Foersch, of Curtiss fame, was appointed Chief Mechanic.

G. Elias and Bros. are completing a special Liberty motor ship for Harry Hilliker which should be flying this month.

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FOREIGN AERONAUTICAL NEWS IN BRIEF

FRANCE

APPROPRIATIONS in the 1927 budget, already adopted by the French Chamber of Deputies, provide for subsidies to French aviation companies to the amount of 78,650,000 francs ($3,106,675 at the current exchange rate of $.0395), as compared with 60,500,000 francs in 1926.

GOVERNMENT prizes were given French aeronautical firms at the close of 1926. The sum of 50,000 francs was given to the Breguet Company, manufacturers of airplanes, and the Hispano-Suiza Company, manufacturers of engines, for the record breaking non-stop flight from Paris to Djask (approximately 3,500 miles). A prize of 25,000 francs was given to the Bleriot Company, manufacturers of the plane which established a new altitude record of 7½ miles. A prize of 10,000 francs was given the Rateau Company for the turbo-compressor used in altitude flights. Prizes established for speed records with airplanes and seaplanes, and for endurance flights, were not awarded due to previous records remaining unbeaten, or, as in the case of the seaplane speed record, a French plane was not the winner.

THE French Latecoère Airline Company and the Argentine Government have completed negotiations for a combination air and sea mail service between Argentina and France to begin on September 1. The agreement stipulates that the trip be made in 7½ days, which will gradually be reduced to 4 days.

The plans call for the transportation of mail by airplane relays between Toulouse, France, and the Cape Verde Islands; by fast steamer from the Cape Verde Islands to the island of La Fernando-Norohna, off the coast of South America, and then by air again from La Fernando-Norohna to Buenos Aires. The company has 200 airplanes, 40 hydroplanes and 9 fast boats.

PREPARATIONS are busily going forward in several airplane factories for competition for the Orteig $25,000 prize for a direct Paris-New York flight, and transatlantic traffic by air during the coming Summer seems likely to be active.

ENGLAND

SPECIAL courses on air transport are a recent development of National Traffic College, which specializes in all forms of transport. The course of studies on Commercial Air Transport are the work of Major R. H. Mayo, the director of the Aircraft Operating Co., and the Consulting Engineer to Imperial Airways, Ltd.

AIR customs passes have been introduced by the Royal Aero Club for the benefit of British airmen abroad and private owners of aircraft touring the Continent. These passes serve the same purpose as motor-car "triptyques." They are in the form of paper-covered books with detachable sheets and counterfoils, and are applicable to balloons, airplanes, seaplanes, amphibians and helicopters. They are officially recognized by Great Britain, Belgium, France, Italy, Holland, Roumania and Switzerland, and carry the guarantee of the Aero Clubs of 25 nations. The cost from the Royal Aero Club is only £1.11.6, and the passes serve for the customs on foreign aerodromes and relieve owners of all troublesome formalities.

THE latest type Fokker machine is fitted with a 450 h.p. Napier aero engine. It is all metal, long distance sea reconnaissance flying boat of the sesquiplane type; has a maximum speed of 112 m.p.h. with a useful load carrying capacity of 2,640 lbs. The great advantage of the duralumin hull is that there is no loss of efficiency by water soakage as with those of wood construction.

This boat can be used as a military machine with a crew of three but can very readily be converted into a commercial airplane with a comfortable cabin situated in the middle of the hull.

This British designed and built Napier engine is becoming increasingly popular in all parts of the world because of its high performance and reliability, which has been demonstrated on long distance flights and in actual service—commercial and air force.

AUSTRALIA

FLYING on a commercial basis has been carried on in Australia only during the last four years. Air services are not operated on routes that compete with the railway lines and other means of communication, but are established in those districts where railway facilities do not exist and where the carriage of passengers and mails can be profitably undertaken.

The first service established was between Perth and Derby, in Western Australia, a distance of 1,443 miles. This route was opened in December, 1921, and since that time the number of letters carried has increased from 500 to 20,000 a month.

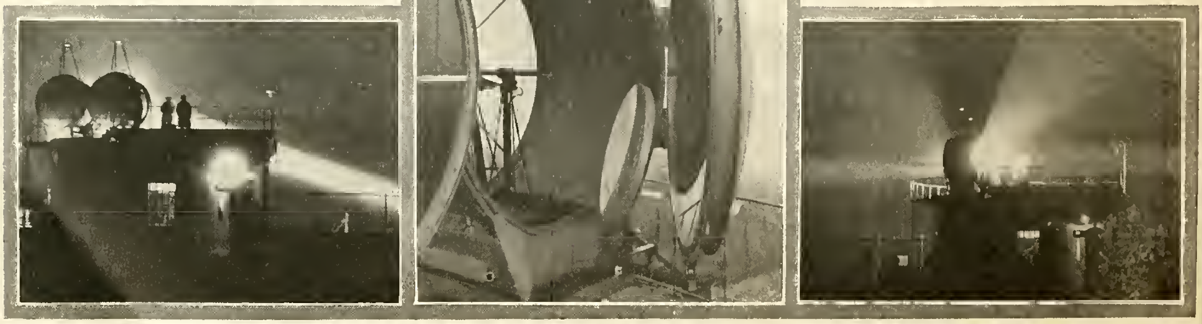
The Adelaide-Sydney route was established in June, 1924. In July, 1925, it was decided to make Cootamundra (New South Wales) the eastern terminus, whence the short journey to Sydney is made by train. The line was further extended at this time from Hay to Melbourne and from Broken Hill to Melbourne. The Adelaide-Cootamundra service is weekly, and the others biweekly.

The Charleville to Cloncurry route of the Queensland and Northern Territory Aerial Services, Ltd., known as Qantas, Ltd., was inaugurated in 1922. It has since been extended to Camoomeal. Bi-weekly service for passengers and mail is maintained. Since its inauguration, the company has flown over 400,000 miles without injury to passenger or personnel.

Fifty minutes, instead of five hours, will be the time taken to travel between Brisbane and Toowoomba when the regular daily air service, proposed by Qantas, Ltd., is put into operation this year.

THE De Havilland Co. intends opening a factory in Melbourne this year for the manufacture of aircraft. This will be the first air factory to be opened in Australia. The company will concentrate on manufacturing Moths suitable for conditions there.

THE cause of aviation in the Pacific Islands received encouragement recently when the Pacific Islands flight of the Royal Australian Air Force was concluded safely, after a trip covering 10,000 miles.



Night trial of the biggest aviation beacon in the world just completed at Mt. Valerien, outside of Paris.

A Napier-engined Fokker flying boat, built in Holland.

HOLLAND

AN important incident of the 1926 summer service of the Koninklyksche Luchtvaart Maatschappij (K L M) was the accomplishment of the important connections London-Malmö and Paris-Malmö via Rotterdam, Amsterdam and Hamburg, with its own airplanes. The company had to meet the keen competition of foreign aviation companies—three lines, the Imperial Airways, Farman and the Swedish Aerotransport and German Air Union, were connected at the Amsterdam junction, and ran over the same routes as the K L M.

Besides these three lines the company maintained a twice-a-day service to London and to Paris. The airplanes in this service made 5,000 kilometers per day with 8 pilots, some of whom made 24,000 kilometers in the air per month. This program was carried out with 12 Fokker machines of the type F. VIIa with a 400 h.p. aircooled motor and a metal propeller, and with accommodation for 8 passengers and 2 pilots.

In the summer service, 845,100 kilometers were covered within 5,634 hours of flying. In the first nine months of 1926 the total transport on all lines of the K L M amounted to 5,952 passengers and 206,614 kilograms of goods, as compared with 3,536 passengers and 149,500 kilograms of goods in the corresponding period of 1925.

In addition to the foreign lines already mentioned was the line Berlin-Amsterdam, with connection westward with lines to London and eastward with lines to Königsberg and Moscow; and the line Amsterdam-Frankfort connecting in Frankfort with lines to Basel, Zurich, Munich and Leipzig. All foreign connections went via Amsterdam. Only one service, a German line, Dortmund-Essen with a connection to London went via Rotterdam. All services of the K L M called at Rotterdam.

When the winter service began the number of services to the Netherlands decreased. The services to Paris and London were continued, but, due to unfavorable weather, the service to Scandinavia was discontinued.

Due largely to improved equipment the working expenses of the company have decreased considerably. In 1920 the cost per ton of the company's operations amounted to 4.60 florins ($1.84) while in 1926 it was reduced to 1.35 florins ($.54).

GERMANY

UNDER the terms of the agreement reached between the Interallied Ambassadors' Conference and the German Government last Summer, five Reichswehr officers will be permitted to take courses of instruction in flying during the present year.

Candidates will not be detailed by the army, and applicants who take the course, which will be under civilian instructors, must pay their own expenses. Officers must obtain the consent of the High Command before taking the training, which is regarded in military circles as a sport like golf or tennis. The students will not receive any extra leave of absence because they are candidates for pilot's licenses. The Reichswehr at present contains twenty-four qualified flyers, who obtained their licenses under the Imperial Army.

THE majority holdings in the Junkers airplane factories, located in Dessau, Germany, with branch plants in Russia and other countries, will be returned to Professor Junkers by the German Government. According to the agreement, the Government gives Professor Junkers all the stock it owns and pay the losses to date which it is alleged were incurred through the Reich's operation, though the amount is not mentioned. This move withdraws the Government subsidy from Junkers for the construction of airplanes.

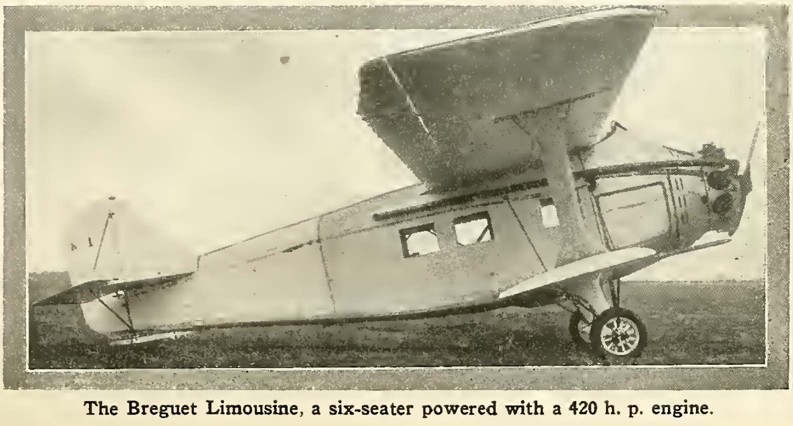
ITALY

COMMANDER FRANCESCO DE PINEDO, Chief of Staff of the Italian Air Forces, who set out from Cagliari, Sardinia, on February 13, in his hydro-airplane "Santa Maria" on an attempt to tour four continents in a 30,000-mile flight, landed at Fernando Noronha, Brazil, February 23. Owing to damage to his plane while moored in the Bay of St. Antoine, he was forced to remain there until repairs could be completed. Commander de Pinedo took off again the next day, after hastily patching up the damages, and arrived at the mainland of Brazil late on the afternoon of February 24. On February 25 he reached Bahia, Brazil, and Rio de Janeiro on February 26, where he was given an enthusiastic greeting by huge crowds.

Unusual atmospheric conditions forced the Italian flyer to abandon his plans for a nonstop flight across the Atlantic from the mainland of South Africa to the mainland of South America. Porto Praya, Cape Verde Islands, was then made the base for his transoceanic hop, which was Commander Franco's point of departure last year in making the first airplane flight across the South Atlantic.

The hydro-airplane and motor are wholly of Italian manufacture. The Savoia plane weighs 3,400 kilograms and carries 2,700 kilograms of fuel and 290 of oil; the motors are two 550 h.p. Isotta-Franschini. It can make a speed of from about 100 to 125 miles an hour. It carries no wireless aboard.

EXISTING air lines in the Upper Adriatic are as follows: Venice-Trieste, twice daily each way (except Sunday); Trieste-Zara, once daily each way (except Sunday); Venice-Vienna, once daily each way; Venice-Rome, one daily each way (part of Rome-Venice-Klagenfurt-Vienna air service.) The Trieste-Venice-Pavia-Turin air route was discontinued for the winter months, on October 15, 1926, and has been replaced by the Trieste-Venice air route. The Venice-Trieste and Trieste-Zara air routes are operated separately but are part of concessions of the same company, the S. I. S. A.



The Breguet Limousine, a six-seater powered with a 420 h. p. engine.

Picked From the Air

AERO DIGEST will award a prize of $5 each month for the best humorous contribution published. Only those pertaining to the aircraft field will be considered. Address the "Picked From The Air" Dept., Aero Digest, 220 West 42nd Street, New York, N. Y.

F. Thomas Grula, Detroit, Michigan, won the prize for March.

Irate One: "Where in the world did you pick that new pupil? Of all the——!"

Pilot No. 2: "Whatsamatter, is he dumb?"

Irate One: "Dumb? He's dumber! Imagine this: last night, when I nosed over, I told him to get a prop for my Jenny and the everlasting idiot brought me a walking-stick and asked, 'Where is the lady, Sir?' "

The Winged Nurse

"Do angels have wings, mummy?"

"Yes, darling."

"Can they fly?"

"Yes, dear."

"Then when is nursie going to fly, 'cause daddy called her an angel last night?"

"Tomorrow, darling."

—Wing Slip.

◆

Judge (to prisoner): "What is your name, your occupation, and what are you charged with?"

Prisoner: "My name is Sparks. I am a radioman and I am charged with battery."

Judge: "Officer, put this guy in a dry cell."

Farmer Brown: "They did have airships in biblical times so these gol dern things ain't so new after all."

Mrs. Brown: "How come, Hiram?"

Farmer Brown: "Esau sold Jacob his heirship for some soup."

A man in Baltimore recently had his plane stolen. No doubt the thief grabbed it and just flew.

—Tail Slides.

◆

The country is divided into postal zones. We presume the air mail routes will be called ozones.

—Tampa Tribune.

◆

Muggins: "Has anyone ever attempted to explain to you the principles of aircraft aviation?"

Buggins: "Yes, but it goes right over my head."

Their Destination

A balloon ascent had just taken place, and a tiny gal among the spectators turned to her mother with the query, "Mother, is God expecting those gentlemen?"

◆

Kind Old Lady: "Now be careful, young man! This is my first trip up in a plane."

Pilot: "Don't worry, Mam. It's my first trip up too!"

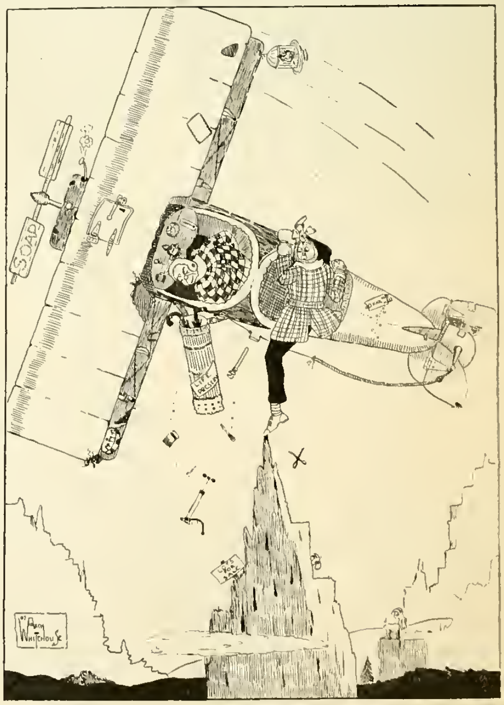
◆

The colored flyer was preparing to start on a hop for the altitude record.

An experienced observer standing close by, noticing the absence of an oxygen supply for use in high altitudes, remarked: "Are you taking no oxygen supply with you?"

"Ah, sho' am, boss! I jus' drank a quart of this here liquid air. An when it starts to 'vaporate I'se gwan to have oxygen to burn.

—Otto E. Jess.



Solved at last!—Practical Rocky Mountain aviator solves age-old aeronautical problem of what to do with prospective passenger who is willing to fly if he can keep one foot on the ground. Cy Caldwell has a better solution.—Read his idea on opposite page.

HOME DEFENSE

By Cy Caldwell

TO my friend Lloyd O. Yost of Pinehurst, No'th Cahlinah, Suh, I am indebted for a useful idea; and I have so few useful ideas that I value one when I get it. Lloyd is the Waco distributor for No'th Cahlinah, Suh, and runs a field that only himself in a Waco or anyone else in a helicopter could land on. It's one of those little fields that you get as a surprise in a box of popcorn.

I wrote suggesting to Lloyd that he act as representative of Aero Digest on his field, if it was large enough for him and a customer to stand on together. And Lloyd came right back and thanked me for the idea; and, says he "Glad you mentioned it. I think it ought to work out well, especially on those Modocks who come to a flying field prepared to get a thorough course in aviation by the simple expedient of asking the dashing pilot innumerable questions. I shall try hooking them for subscriptions to Aero Digest as a means of diverting the flow of questions, assuring them that the magazine will tell them all that they wish to know. So here's to 1927 and a grand method of shaking the insistent Modock of the 'innocent question' species."

Now, there you get the idea in his own words. How many times have you wondered what to do to the bozo who comes around imitating the well known interrogation point? ? ? It's against the law to kill him, for the law is an imperfect instrument of human desires. Even if he says, "Well, I'd fly if I could keep one foot on the ground," like the high stepper on the joke page opposite, you are forbidden by law to mutilate him in any way. In short, until Lloyd gave us this idea you had no redress. But now, without incurring any legal penalty, you can settle this questioner. You can sell him a subscription to Aero Digest! This magazine wants a news and sales representative on every flying field in the country—yea, even in the sacred harbors where rest with folded wings and leaking floats the gulls of the Navy. Write the Subscription Department at once for the profitable particulars. Do not delay, Time and tide and the Air Mail wait for no man, and only occasionally for fog. Thirty-five years ago Henry Ford had an idea that led him on to fame and fortune. And he had to think of it himself. Here's an idea for you, already thought out. Avail yourself of it, and arm yourself with Aero Digest subscription blanks so that you may defend your flying field against the attacks of a questioning enemy armed with interrogation-pointed arrows of chatter.

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LT. LEIGH WADE, Round-the-World-Flyer, says: "Your course is a wonderful exposition of the fundamentals of aeronautics. I can readily recommend it for those seeking authentic information."

Floyd J. Logan—Aviation Jobber—Cleveland, writes: "Your course gives to the layman, in simple language, answers to questions which exist in the minds of all beginners."

HUNDREDS of letters have been received from our students. This one is typical. "After studying your course, I took a hop with a local pilot. He told me I was better informed aeronautically than his students who had ten hours "solo."—Dr. W. W. Peters.

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A NOD AND A WINK

(*Continued from page 181*)

Valley at a good thirty miles an hour the heat waves gradually stopped emanating from him, and he looked quite comfortable sitting in the gentle breeze from the old wooden propeller, which was very drafty, as the grasshoppers had chewed holes in it.

Over the Allegheny and the Clarion Rivers we flew at full speed, almost thirty-six miles an hour, while the air grew colder and colder. I was behind a big windshield, and felt snug. Len, in the windswept front seat from which all cowling and the shield had been removed to make room for the returning music-box, got the full benefit of what air was stirring, and slumped down out of my sight. I thought he was asleep. But he wasn't. I saw him come up, shudder violently, and stick both hands out behind the exhaust pipes. Then he rubbed his face and beat his arms across his chest. The interesting chappie seemed to be amusing himself. Then he started to sing—or I thought he was singing. He opened and closed his mouth while he looked back at me. He was not singing, however, as I learned when I throttled the motor. He was saying things. I won't mention just what, for this journal goes into the home, and children pick up that sort of thing quickly enough as it is. I gathered from his remarks that he was cooler than when he started.

Well, I opened up again and passed the little town of Brookville, while Len continued his calisthenics in the breeze. I was glad to see him taking such an interest in the trip. Unlike some passengers who merely sit and look around, Len did a sort of sitting down dance, which he varied from time to time by sticking his hands behind first one and then the other exhaust pipe. He seemed quite mad about them.

At Clearfield he pointed down at a large comfortable house with an old-fashioned chimney wandering up one end of it. A thin ribbon of smoke trailed into the clear cold air. We were quite low and could see how homey it looked. Len was shouting something. I throttled back and heard, "Let's land! Get warm!" I thanked the kind fellow for being so thoughtful of my comfort, but told him I wasn't very cold. The dear chap's solicitude for me was touching, indeed. In fact, it's amazing how kind and thoughtful many people have been to me all through my life. Dear, dear!—But I must get on with seeing America and keep at least some of our people home here next summer.

Swinging north over Snoeshoe along the Air Mail route we flew through a gap in the Allegheny Mountains, crossed Bald Eagle Creek—the last bald eagle left there in the early hoop-skirt period—and glided down to the Air Mail field at Bellefonte. Much could be written of Bellefonte—but why speak ill of the dead? It's one of those places that makes the thoughtful ponder on the immutable sadness of this fleeting life—though if you want to make it less fleeting, go to Bellefonte.

Len seemed reluctant to leave the plane. He just sat there looking about him. "Come, come," I said kindly. "we must hump ourselves and put gas and oil into this contraption." He merely looked at me. He had the dazed expression of a man who has just been married and is realizing slowly what has happened to him. He turned his head from side to side, then gingerly moved his arms. "I'm not yet stiff!" he said, as though in wonder. Then he

(*Continued on page 244*)

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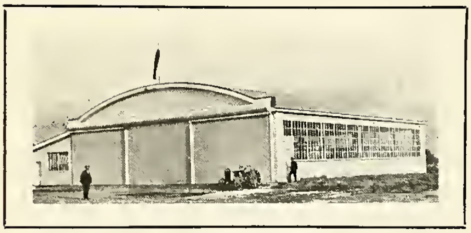

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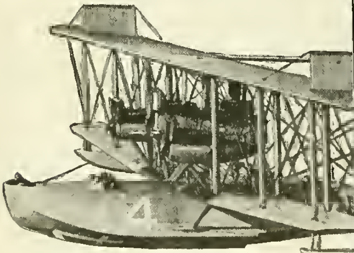

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(*Continued from page 242*)

crawled out slowly and stood on the ground. "A stove!" he muttered hoarsely. We led him into the office and left him to thaw.

When we had filled up it was too late to push on to Camden, so we stayed in Bellefonte, one of the world's finest sleeping towns. Once darkness falls, not a sound disturbs the mausoleum-like stillness. And not more than one or two sounds shatter the quietude even on a busy day. After an evening there you go outside and relieve yourself by howling at the moon. Not a soul hears you.

Cold clinging fog hid the mountains next day, and it was noon before we flew over the Seven Sisters Mountains, followed the Juniata River to the Susquehanna. Rural Pennsylvania is a country of hills and valleys, of creeks and rivers, of forests and cleared spaces, a land of romance and beauty, soothing, restful. The motor hums, the plane glides on; and cares and troubles slip away and are lost in the haze that clings to the mountainsides and closes in behind us in the valleys.

Here and there, scattered about in the woods, or floating serenely in the river, we could see dozens of Navy planes that had started off on some much-advertised long-distance flight, and, of course, had had to come down before they got anywhere, to the secret amusement of the Army, who always pretend to be bitterly disappointed when the Navy fails to get away with a publicity stunt. There were both the PN-10s floating along on the Susquehanna, sending frantic radio messages imploring the cruiser *Cincinnati* to come to their assistance. They had flopped on all their ocean flights and now they were trying the rivers and creeks. Far down the river we could discern the battleship *Florida,* the cruisers *Rochester, Denver,* and *Cleveland,* with a flock of destroyers, all steaming madly to the PN's assistance. They had been waiting at the proposed destination for the Naval Aircraft Factory's annual flying deficits to appear. We couldn't tell whether the Navy was experimenting to discover if a PN could fly up a creek and get anywhere, or if they were merely hunting for a hiding place for their battleships in the next war.

If the Navy doesn't stop pulling these vaudeville acts that never go over, we'll just die laughing. And then who would be left to pay the taxes for them to play with? But if they're determined to work in small-time vaudeville they'd better get E. F. Albee or some experienced showman like that to manage them. And then they would be told to try the act out in the sticks and find if it works, before they give it a lot of Broadway publicity, and end in a flop.

At Harrisburg we left the Susquehanna with its broad island-dotted reaches, its wooded banks, and its faint odor of decayed fish, and swung east to Reading, flying over level pastoral country dotted with farms and villages, with, here and there, a verdant pasture wherein contented cows toiled away happily, filling evaporated milk tins. Milk inspectors were tramping about, chatting with the cows, asking each one if it was contented, I suppose, according to the ads.

There below us was Casey Jones, looking for some nationally advertised person like Gene Tunney to take for a flight, so he could get his picture in the papers, too. Casey has even invaded the nursery for a passenger, you know. That laddie who wrote to Wilbur on air defense, little Izzy Kibitznick Maloney, 2nd,—Casey got him and took him for a flight, and they both had their pictures in the *Evening Pornographic.* I hope that Jackie Coogan and Baby Peggy lose their fountain pens, or Wilbur will get two more letters and Casey will capture two more little passengers.

You can't keep the kids and the pilots out of the gnus-papers these days. Isn't publicity wonderful? I'm no good at getting any, myself. Why, last May I flew Casey (Himself) Jones 400 miles from Kansas City to Indianapolis—he had a parachute—and all I got for it was a small drink of Scotch. Well, what do I care for publicity? I can write my own.

At Reading, a heavy fog, that grim old man of the air, reached up and engulfed us. Down to fifty feet we glided, and still we slipped through fog. "Oh, di mi!" as those Kansas he-men say. A hazy splash of water beneath our wobbly wings—the Schuylkill—turned and twisted. At Pottstown—there's a pretty name for you, Pottstown!—we were below the smokestacks on the bank. And there were bridges crossing the river. Cares I had left in the peaceful hills—you remember my saying that cares slip away and are lost in the haze?—well, I was a bit previous. They all came crowding back. Life soon catches up with us, doesn't it? We fly along serene, masters of our destiny; then the fog closes in and forces us down to earth, and we feel that, after all, we're rather pitiful little atoms, small potatoes, as it were, and very few in the bag. But imagine me moralizing! And in New York, too!

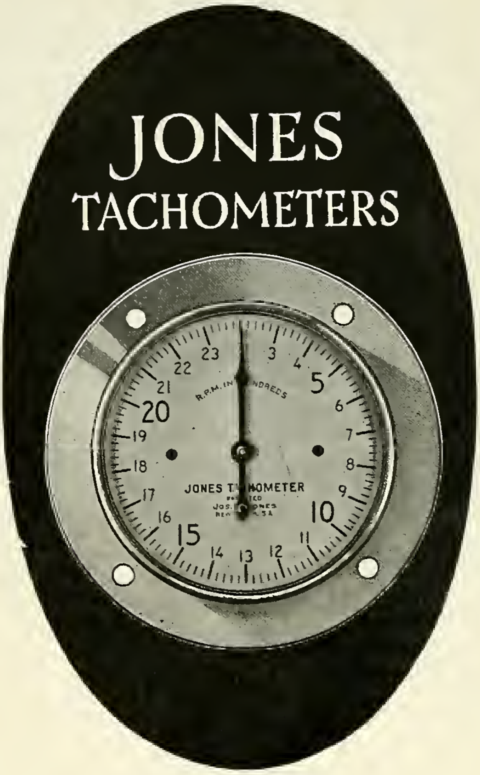
At Phoenixville the fog dropped right down, shrouding all view ahead. And I never have thought I'd look good in a shroud. A thin drizzle added to the general merriment, and old man Gloom crowded right in the cockpit with me. Even Washington, I felt, could not have crossed the Delaware that afternoon. Certainly not in the Galloping Goose. We swung in from the river and skimmed tree-tops looking for a landing field. A high-tension line tower loomed ahead. I honked to the Goose, and it leaped up into the low clouds and flapped over. There are moments in every man's life—but no matter. We went over, that's all, and down again to skim the fields. After what seemed a long hunt to the weary Goose and myself we saw a level, clear field, and landed.

Len climbed out and divested himself of his parachute—which had been utterly useless for the last half hour. "Well," he said calmly, "I was waiting for the bump." He's an excellent mechanic, and I regret that he is forever lost to the further conquest of the air. For lost to it he is. He is willing to act as a consultant, to speak in an advisory capacity, even to work on a plane if necessity demands. But as a flying mechanic he's through. He says he's married, he says the work's too cold, and that one is too apt to stay cold, permanently. And that's that.

I left him at a farmhouse nearby, while I went into the drab hamlet of Phoenixville. I believe a Phoenix is a legendary bird that rose from the dead. It may have, but the town hasn't. It will be a fine place to go in the autumn of life. There, with the hurrying world shut out, you may grow old gracefully, and absolutely undisturbed.

The field in which we had landed was small, so in the morning I left Len and rose alone, like a Phoenix. I was very glad to go, for I had made a bitter mistake in that town. That morning I met a girl who lived in the farmhouse where I had left Len. Beside her, the beauty of hill and dale and whispering stream paled to insignificance. She was sixteen, and she said that she would like to spend the evening talking to a pilot about aviation. I would have been glad to tell her all about it, in a fatherly way, of course. Instead, I had sat forlornly in the hotel parlor reading The Ladies' Home Journal, 1892, Needlework, 1889, and Baby's Own Nursery Rhymes, written

(Continued on page 246)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(Concluded from page 245)

by a government employee named Wilbur.

Down the Schuylkill, past dreamy Philadelphia, flew the Galloping Goose. At Pine Valley, in the State that God forgot, the Orfultone music-box was strapped to the Goose's back, and we leaped into the air again with all the mad abandon of a mud turtle hieing homeward after a hard day on the golf links. With a strong tail wind we hummed along to Cleveland, arriving there in the spring of 1894.

The rest of the journey is graphically described by Sears, Roebuck & Co., Grocery Department, by special arrangement with the Nickel-Plated Rolled Oats Co., of Battle Creek, Michigan. Copyrighted 1892. Foreign patents pending. All rights reserved, including a lower berth on the first train out.—

THE way was long; the night was cold; the pilot was infirm and old. His flying-suit, well-lined with hay, seemed to have known a better day. Galloping Goose, the craft he flew—stuck together with nails and glue—shivered and shimmied and waved its wings, shaking off nuts and bolts and things. So weird and palsied was its flight that folk on the ground looked up in fright, and cried, "For Heaven's sake, beware! An airplane's ghost is in the air." Yet on the ancient pilot flew, trusting in God and Caseine glue. A brunette angel flying 'round a thousand feet above the ground said, "Come, old pilot, to my heart, before your flivver falls apart. I've been sent to take you to Hell." The pilot yelled, "Old girl, that's swell! I deserve it—I'm full of sin—and Hell is better than what I'm in." He passed away without a moan. The Galloping Goose flew on alone.

PROTECTING OUR FORESTS FROM FIRE

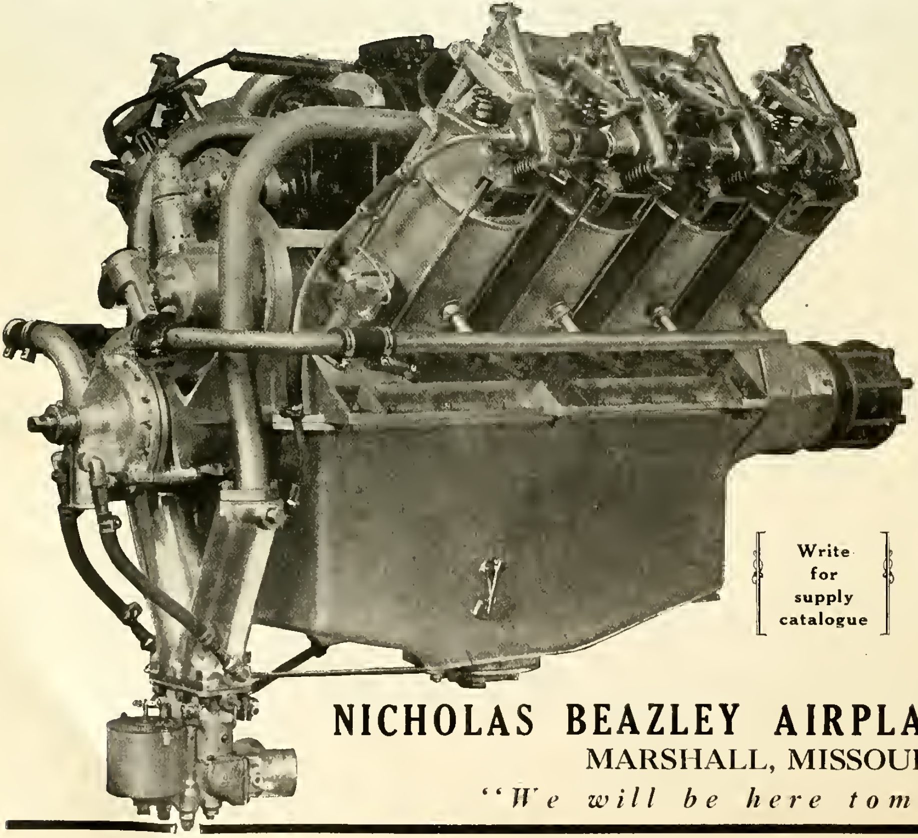
(Continued from page 173)

landed a few men at each of these fires, control would have been simple, as they were still small, easily extinguishable. In most instances they were in remote inaccessible places, miles from a trail, on the steep slopes of heavily timbered mountains. They were so numerous and widely scattered that it evidently must be several days before some of them could be reached. The problem of getting men and supplies into parts of this country was all too obvious. Under favorable conditions of wind and humidity, a few days time might make of this splendid forest of virgin timber, a roaring, devastating mass of flame and smoke, destructive to everything in its path and dangerous to the lives of men recruited to combat its fury.

At the end of four hours and thirty minutes of flying more than fifty lightning fires had been located. As our base was nearly 100 miles distant and our gas supply was limited to one more hour, we were compelled to start for home immediately.

Passing over many of the fires we had worked over a few hours before, their menacing growth already was noticeable. A map containing the location of the fires we had spotted, with a message describing each one in detail, was dropped at the forest supervisor's headquarters.

For the past week the air patrol had been on the move virtually from daylight till dark and conditions were growing steadily worse. Fires had broken out in Montana in the Glacier Park country; the Coeur D'Alene, St. Joe and the vast Clearwater forest each had a great, roaring, uncontrolled fire. Following a devastating wind which raged for twenty-four hours, an immense calm settled over the entire country, but the unprecedented dry spell with



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Landing gear struts for JN4D all shaped, front $2 each, rear $2.50 each or $8 for set of four; axle collar 60c. Booster magneto $15. Climb or banking indicator $2.50. 120-lb. oil gauge $2; 10-lb. air gauge $1.50. Oil or water temperature gauge with tubing $7.50. Air speed meter with venturi and tubing $15. Dandy compass $15. Five gallons fresh Nitrate dope $9.00 or 25-gal. or more $1.50 per gal; 50-gal. bbl. $67.50. Gov't Spec. cotton cloth 60c yd. or 65 yd. to 100 yd. at 55c yd. or 101 to 200 yds. at 50c yd. Grade A cotton scalloped tape 5½c yd. or 112 yd. rolls 5c yd. Ordinary scalloped tape 4c yd. or 130 yd. rolls 3½c yd. Frayed edge cotton tape 5c yd. or 100 yd. rolls 4½c yd. 10" double point needle 35c. curved needle 35c. Linen thread 35c spool. Rib cord 1c yd. or $3.00 lb. Linen and cotton covers all made up for JN4D, Canuck, and Standard. Binding tape: 1½" 3c yd; 1" 2½c yd; ½" 2c yd. Eyelet punch with 100 eyelets $2.50.

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its attendant low humidity had brought on a condition of extreme inflammability.

Then the Kaniksu, a regional, seasonal wind, came up and the numerous fires joined until the entire forest of more than one half million acres seemed threatened. In little more than a week 50,000 acres were burned over in this forest alone.

Our daily reconnaissance flights kept officials informed as to the condition of the going conflagration, and our contour maps, containing sketches of the far flung fire lines, aided the ground forces in laying their plans of fire-fighting.

The supervisor had been receiving hourly reports of the spreading fires both from the air patrol and the stationary lookouts. From them his assignments of men and supplies were governed. The smoke was so dense that the stationary lookouts were practically helpless and conflicting reports reached the supervisor's office. He desired to make a personal inspection of the fire zone. To do this on the ground would have required walking around the entire fire area, as horizontal visibility was limited to a few hundred yards. The time involved by this method obviously made it impracticable. Clearly a more efficient way would be to employ the air patrol. It was arranged that I should pick him up at forest headquarters at Newport, Wash.

The excessive heat, together with the dense smoke haze, necessitated the utmost caution in flying. The heat had caused the air to lose much of its bouyancy and the heavy pall of smoke reduced visibility to a few hundred feet. Tearing over the treetops at 100 miles per hour, nothing but an uncanny knowledge of the country permitted any sort of navigation. Following through a narrow draw, the winding course of a mountain stream, or skirting around the edge of a steep mountain, one had to be constantly prepared to make a quick pull-up into the blinding smoke, or a sharp turn to avoid crashing into an abrupt rise of ground.

Approaching the fire line the sharp pungent odor of burning pine was discernible. In a few moments the thin red line of fire below, eating its way through the thick underbrush, was visible through the rolls of white smoke. Flying along the edge we soon picked up a control point and continued our course around the fire.

After what seemed an endless time we arrived again at the starting point, having made a complete circle of the burning area. After three or four more trips the observer indicated by written message that he desired to cut through the burn to determine the extent of destruction in the center.

Contrary to the popular belief, a forest fire will spread as rapidly on a quiet day as it will when there is a strong wind. Under the right conditions of humidity and in the right kind of timber coverage, a fire will create its own draft and burn everything from the underbrush to the crowns and spread with amazing rapidity.

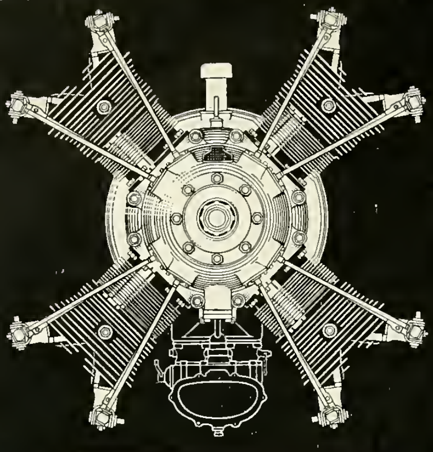
The spectacle of a roaring lashing crown fire is fascinating to behold from the air—a solid wall of dark red flame several hundred feet high, often burning on a front of three or four miles, shooting great billowy rolls of yellowish white smoke thousands of feet into the air.

Crossing the fire line toward the center of the burn, the ship was subjected to a terrific rocking and bumping. The ascending currents, resulting from the heating of the air in the vicinity of a fire, produced turbulent conditions.

As we winged our way into the burned area the smoking,

(Continued on page 248)

R E L I A B I L I T Y



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(Continued from page 247)

smouldering ruins below had a most desolate and inhospitable appearance. The air felt as if it had lost all of its bouyancy. With the throttle wide open the ship staggered along, requiring its last ounce of effort to maintain a bare five or six hundred feet of altitude.

After progressing five or six miles and at a point where the opposite fire line appeared below, we were subjected to the most terrific rocking and bumping I have ever experienced. Bobbing up and down in a series of short jarring jolts, the ship suddenly shot upward so violently that the horizontal movement of air was changed to a vertical one, although the ship remained in its normal horizontal attitude. The controls became ineffective, the depressing force against my body was so great I could hardly move my arms. The motor sounded as if it were tearing itself to pieces.

Glancing across the instrument board I noted the tachometer showed 600 revolutions above maximum speed. The air speed had dropped to almost nothing. The altimeter was acting crazily, the needle jumping back and forth. Looking over the side of the cockpit nothing but yellowish black smoke was visible. The plane had been projected upward so far into the smoke that the ground was completely obscured. Reaching the top of the ascending column, the ship suddenly tilted forward as it started to dive. The motor spluttered and coughed, emitting fire and black smoke from the open exhaust ports. Then it died completely.

Hurriedly feeling over my parachute straps, while this affair, which I did not then quite understand, was occurring, I unbuckled my safety belt and turned to signal the observer to jump. Hesitating for a moment, I again glanced at the altimeter. It indicated 7300 feet above sea level. Quick calculation told me this was some three thousand feet higher than we had been flying a few moments before. Realizing if this was our true altitude there need be no immediate hurry about jumping, and desiring to get as far away as possible from the inferno below before resorting to the parachutes, I settled back into the cockpit and busied myself with the engine controls in an endeavor to bring the motor back to life.

Keeping the ship headed away from the fire as my compass directed, I planned on clearing the ship at 5000 feet by the altimeter, or approximately 1000 feet above the ground. This would give us ample time to think it over, and the possibility remained that the motor would take again.

Sure enough the motor began to show signs of life. So absorbed did I become in this action that all thought of jumping was forgotten. Three, four, five cylinders started cutting in. The motor rocked badly, still vomiting black smoke, but it was in operation.

Again the trees were visible,—too late to jump now! We were fighting desperately to hold our altitude but failing. Just when a crash into the treetops seemed inevitable, the flat, welcome surface of Priest Lake appeared dimly through the smoke below us.

Gradually the motor cleaned itself out, running more smoothly as we swept over the glazed surface of the lake prepared at any moment for a washout, which was infinitely preferable to a crash into the tall timber or a parachute landing back in that fire.

The motor presently was running smoothly again but we flew back and forth over the lake until convinced that it was safe to leave before starting our homeward journey.

THE PHYSICAL STANDARDS

(Continued from page 178)

lens of the eyes is composed of a homogeneous matter, readily capable of changes in shape or moulding. Its shape in general is as that of the glass lens, a segment of a sphere. Around its periphery in a tiny grove or track lies a very small band of muscle tissue, the ciliary muscle. At rest, this relaxes and allows the normal pressure upon and within the eyeball to flatten or thin it out. This gives us distant vision or "universal focus" of anything beyond 200 feet.

Now, as we attempt to focus vision upon nearer objects an impulse from one of the cranial nerves causes the ciliary muscle to contract exerting a compressing force upon the lens and thickening it, at the same time lessening its circumference—since there can be no change in its volume, always preserving by the pressure its spheroid surface. This brings the rays from nearer objects to a focus at the same point as in the former case from more distant objects. The degree of this action is wholly automatic in the normal eye. Its intensity increases in a sort of geometric ratio, or parabolic curve, so that in coming closer than 200 feet, very little contraction is called for until about 20 feet, and after that much more, so that the complete contraction is necessary in the normal eye at about one foot or a little less. This explains the use of 20 feet as the distance used in testing vision—the eye is practically at rest in focusing from that distance. It is only slightly more relaxed at 200 feet, yet very much more contracted at 10 feet.

It is interesting to note at this point that the same nerve which supplies this ciliary muscle also supplies with another of its branches the muscles that rotate the eye inward toward the nose. This explains why you can make yourself "cross-eyed" by willfully attempting to focus upon an object, either real or imaginary, brought to a point near the end of your nose. The overload of the nerve impulse spills over into the other branch of the nerve and excites the muscle that pulls the eye in. Ordinarily, when this one muscle receives its normal impulse, the opposite muscle of the other eye receives one, so that as one eye turns in, the other turns out, as in the military "Eyes Right."

In this test the acuity of vision is measured in terms of what the average of a large number of normal eyes can see at 20 feet. The acuity is expressed as a fraction the numerator of which is 20, the denominator being the distance away that a normal eye can see what this eye sees at 20 feet. That is, a 20/20 vision is normal; a 20/40 sees at 20 feet what a normal eye can see at 40 feet; and a 20/10 can see at 20 what a normal average must be at 10 feet to see. This tests not only the power of the ciliary muscle, but the shape of the refractive surfaces in front of the eyeball as well. The cornea is the layer of translucent material in front of the lens. Its surface normally is the segment of a perfect sphere, but at times due to uneven pressures exerted on the eyeball from without by the muscles which actuate it in its motions it becomes flattened sidewise or up and down, so that this cornea represents the segment of a cylinder instead of a sphere. Like a baseball that the Bambino might have swatted a bit too hard. This produces a loss of visual acuity, called astigmatism.

Section 10 demands of the Transport pilot a visual acuity of 20/20 or normal in each eye. It requires in an Industrial pilot a test of 20/30 in each eye, but provides that it may be 20/40 if in his goggles he wears a correction that gives him 20/40 (by lenses as in spectacles). With unaided vision of 20/30 he may fly with plain goggles. It permits the Private pilot to qualify with as little vision as 20/40

(Continued on page 250)

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opens up a world of opportunities for young men. The **Sweeney System** has no planes to sell, and sticks strictly to teaching both ground work and pilotage. Sweeney Airport is one of the best and safest fields in the U. S. All the resources of this **Million Dollar School** insure you the best, most practical instruction. Mechanics earn $50 to $150 a week. Flyers, up to $500.

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Secondly: After completing this work if you want to be a pilot you take ten hours of flying. Now when you understand that two to seven hours is all the average man needs to learn expert flying you will appreciate what ten hours in the air under skilled men will do for you.

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(Continued from page 249)

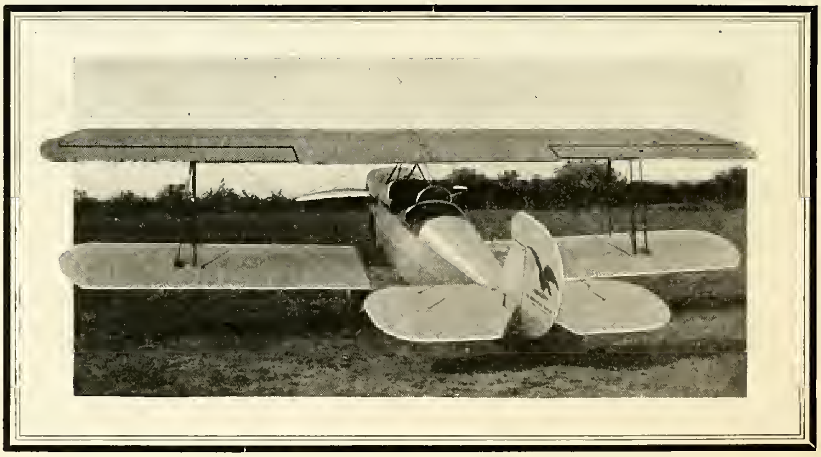
in each eye, and in certain cases decided individually by the Department will permit 20/50 to pass. Both of these provisions, the 20/40 corrected by goggles in the Industrial class, and the 20/50 corrected to 20/30 in the Private class, are predicated upon a further provision, namely normal depth perception as described in the succeeding Section.

Section 11 determines the depth perception, or judgment of distance vertically. This is to assure that the applicant will be able to judge his ground in making a landing, and avoid either flying into it or landing "high." The Department apparently considers this as most important, and places great faith in the method of determination. It has worked out exceedingly well in practise. An apparatus is used consisting of two blocks of wood sliding in grooves toward and away from the applicant, and at a mean distance of 20 feet from him. They are about six inches apart. Standing erect in each is a rod about the size of a fountain pen. Arranged with cords and pulleys manipulated by the applicant, when the one approaches him, the other recedes. With his eyes on a level with them, and directly in front, and with shadowless illumination, nothing but the stereoscopic effect in his own vision can tell him their relative distance from him. A millimeter rule is mounted between the blocks. The applicant manipulates the cords until in his own belief the rods are opposite each other. Their distance apart, toward and away from him, is then measured in millimeters. He is given three trials, and the average is taken. For all three classes a distance of 30 millimeters "off" is allowed as an average for the three trials.

The eye lies within the bony orbit in a bed of fat tissue, which not only serves to protect it from shock, and to keep the external pressure uniform, but also provides a perfect lubrication for the movements of the ball. It is held only by the optic nerve attached to it behind, and by six muscles attached at various places around it to its tough coat which we see as the "white" of the eye. Four of these are the rectus muscles, one above, one below, and one at each side. These when they contract turn the eye up, down, or sidewise (in or out). The other two are obliques, which either alone or in conjunction with one of the recti, turn the eye in the various other meridians, that is up and to the right or down and to the left. The arrangement is such that the eyes can be turned in a circle, as when with head fixed as though to focus on the hub the eyes are made to follow the rim of a wheel, or as when searching the sky for an approaching ship. It will not be difficult to understand that the nerve supply to all these muscles, and their own function constitute a rather delicately balanced mechanism. And a very important one, since perfect vision requires that the two eyes focus exactly together on an object. Note too, that in "Eyes Right" the internal rectus muscle of the left eye is at work, the one nearer the nose, while the right eye is actuated by the external rectus, or the one nearer the temple, each to exactly the same degree.

Failing of a correct balance in this action, instead of the desired single vision with its stereoscopic or perspective effect giving a proper idea of distance, each eye sees separately and there are two objects seen. Barring the effect of imagination, it is the effect of the alcohol on the function of this mechanism that sometimes makes a man see two chorus girls where there is only one. Of course, this doesn't apply to pilots of airplanes.

(In the next issue, Dr. La Roe will continue his discussion of the physical standards for pilots required by the Aeronautics Branch, Department of Commerce.)



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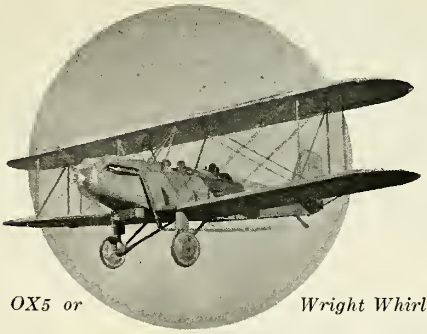

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Exceeds the requirements of the Department of Commerce Air Regulations

BUHL AIRCRAFT COMPANY
MARYSVILLE, MICHIGAN

"THE KID"

(Continued from page 182)

He didn't get any further. Like a flash the Kid was over the table and at him. His body landed square in the Big Boy's arms and his fist landed square in the Big Boy's mouth. The impact from the Kid's jump threw both the fighters to the floor. When we pulled the Kid off two minutes later, the Big Boy had two black eyes and three front teeth were missing. Then the Kid said—"I'm sorry, Big Boy, but I told you we didn't use that word down south unless we were huntin' trouble." Then he bathed the B.B.'s eyes, saw him to his quarters and said "good-night" just as though nothing had happened. The aftermath was, and this is to the Big Boy's credit, he became the Kid's greatest admirer. Of course, the Kid harbored no grudge. He met the Big Boy half-way and taught him a lot of his stunts.

It was on one of their flights together that the Kid walked out on the wing of his plane to wig-wag "hello" to the fellows below. Every man of 'em turned away.

"Is the Kid trying to commit suicide?" said some one.

When they got down the C.O. gave the Kid particular, red-hot hell. He just grinned and said—"What's all the row about? I'm here, ain't I?"

"Yes, but you won't be long if you keep up that foolishness."

But the Kid did keep it up and never did he get a scratch until one day he asked leave to let him spend the week-end at home. The C.O., thinking he was going by train, said 'all right.' The Kid's home was just 200 miles from the field. At ten in the morning he telephoned his folks that he'd drop in on 'em that day at one o'clock for dinner. He did. His father fished him out of a live oak tree, in his own back yard, at twelve forty-five. The Kid had fallen two thousand feet and with the exception of a ruined uniform and a few scratches, he wasn't hurt. His plane was not even badly damaged. He told me later that it was just like landing in a feather bed. "Always," he said, "pick out a nice, big live oak tree to fall in."

The Kid came back to the field on the train. When the C.O. heard his report, he immediately ordered him to Texas, from which place, it so happened, he had that day received a request for the loan of an instructor.

"How'll I travel?" asked the Kid.

"On the train," answered the C.O.

"All right," said the Kid, "I'll leave tonight."

"Good," said the C.O. "Now I know you'll get there alive, anyway."

"You're damn'd tootin," said the Kid as he walked away.

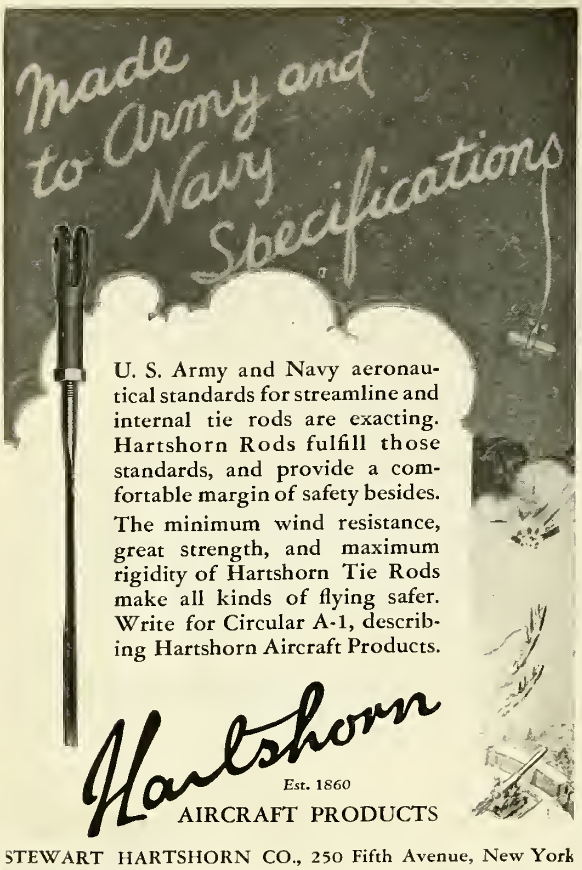
"C. O.", I asked. "Why do you let the Kid talk to you like that?"

"Well," he replied, "I happen to know all about that boy and his family. I know, too, that the Kid has refused three commissions, because, he said, he didn't want to be weighted down with shoulder straps and could do better instructing as a private with privates; and finally, Captain, because I'm so fond of him. I honestly hate to see him go, but if he stays much longer I'll have a nervous breakdown. That's really why I'm sending him away. I just can't stand the strain of his stunts any longer."

The Kid left us that night. Two days later the C.O. received the following telegram, collect—

"Saved the Government five hundred dollar repair bill and railroad fare by fixing up plane I damaged at home last week and flying to Texas in it. Told you I'd get here safe."

The C.O. exclaimed, "he ought to be court-martialed!" But, as far as I know, he never was.



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ENGINEERING IN AIRCRAFT

(Continued from page 174)

order to determine the proportion of total lift carried by each wing. In body group analyses one of the points of importance in order to solve the fuselage trusses is the panel loads; that is, the proportion of loads which must be assumed acting at panel points. This entails a study of methods of supports and in order to save weight a careful survey of all the main items must be made. The study of the methods of support is important also from the standpoint of strength because a member may be loaded in bending besides carrying an axial load and this must be taken into consideration.

After the analyses are completed they are checked by the engineer in charge of the technical section and then the methods, assumptions and such points as are of vital importance are submitted to the chief engineer for approval. Control surfaces and surface controls are usually sand tested. This is particularly important to determine the deflections, lag in the system and ease of operation under load. The control surfaces and surface controls are preferably tested together on a jig imitating their actual erection on the machine. Forces on the stick and rudder bar or pedals are indicated by means of dynamometers and deflection of the stick obtained to see that the system does not yield too much. Sand bags are piled on the surfaces in such a way as to approximate as closely as possible the distribution of air load over the surfaces.

After having assigned the sizes of principal members the detailed design is started, i.e., the design of fittings, secondary members, hinges, etc. This phase of design is just as important as the general design and the designer gives it just as much attention. Strength of structure can be impaired by a faulty detail and cost and weight of the craft may become excessive because of poorly designed details.

In designing a fitting, hinge or similar item there are consideration of weight, cost, interchangeability, ease of maintenance, rigging and inspection facilities, mass production possibilities, etc., to be reckoned with. Several variants are considered and the most promising one drawn up.

In the meantime strength of the part is calculated from the knowledge of maximum and simultaneous loads acting on the part. Maximum loads govern the size of different parts of the fittings, while simultaneous loads usually govern the strength of attachment of the part to members to be joined. Then the weight is calculated and if the part is considered satisfactory in all respects a working drawing is made. Afterward the drawing is checked, approved by several engineers who are responsible for different phases of the design and only then is it turned over for government inspection to be approved for production. All work done on a fitting is recorded on a special form and preserved for future reference. Thus with the main analyses there are available calculations and other information on every important detail in the machine.

In design of details consideration must be given to the local weakening of parts due to holes, heating operations, secondary stresses, etc. Safe margins must be allowed in complicated parts and details of importance are tested. Wing ribs, wing hinges, lift wire fittings, etc., are tested to verify the strength. Tests are arranged so as to imitate the designing condition.

In connection with the question of detail design its importance will grow with the advance of aircraft. Future giant planes will present more varied problems and simple parts of to-day will then be complicated structures involving intricate analyses and calculations. Wing ribs will be huge trusses, comparatively much lighter than they are at present. To illustrate the lightness of airplane construction I cite as an example a wing rib which weighing but 8 ounces is able to support an ultimate load of 950 pounds.

The reliability of aircraft engineering can be judged by its record. Structural failure in the air of a new plane is unknown; failure in the air in general (according to statistics) is extremely rare and can possibly happen only with an overstrained, poorly inspected old plane. Inspection facilities are always considered by engineers and points of importance are made accessible for that purpose. Vibrations may detrimentally affect the strength of parts and this possibility is met by making parts sufficiently heavy to be well below the fatigue limit.

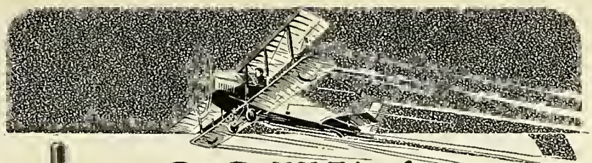
Considering the comparative youth of aircraft engineering one may feel confident by the advance of our knowledge in such a short time. Theory and practice were usually considered antagonistic and it was for aircraft engineering to prove that scrupulous investigation with proper inspection of production and selection of material gives results in perfect agreement with science. Aircraft engineering is more scientific in nature than other branches of engineering and the more scientific it becomes the greater strides will be made in achievement. At present calculations are not considered as a lot of figures but are a reliable source of information, saving cost, eliminating waste and have a real practical value accepted by most "practical men" in the game. Of course to achieve results there must be a harmony between theory and practice and an engineer should deal not only with abstract figures but consider the production difficulties and change in material due to manufacturing processes, etc.

In the factors influencing the advance of aircraft engineering one cannot overlook the beneficial influence of the services—the Army, Navy and the National Advisory Committee for Aeronautics. The American aircraft engineer is indebted to the Army, and Navy, indirectly for their requirements and directly for the information which is available to engineers through these agencies. In the United States, the Army and Navy were the first to gather scattered information and give in their specifications complete technical outline of airplane design. They were not satisfied with purely technical works alone but gathered scientific data, made researches and enriched the technical library with records of value.

The rigid requirements of the services affected the standard of American aircraft and influenced methods of aircraft engineering. Besides the Army and Navy gave the industry technical engineers with wide experience and broad knowledge.

The National Advisory Committee for Aeronautics in addition to the technical and scientific work which is available through official reports, memorandums and notes, maintains an aeronautical intelligence office which supplies to everyone interested, information of the most varied nature. This useful service is very helpful to engineers.

These agencies help to improve the standards of American aircraft engineering and its present state is largely due to them. With the present state of aircraft engineering and the enactment of the new Air Regulations the public may feel safe in trusting airplanes with the same security as they trust their automobiles.



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AIR—HOT AND OTHERWISE

(Continued from page 172)

States appropriations ran three billions and a half and receipts three and three-quarters, leaving a surplus in round figures of $200,000,000—which worried Mr. Mellon to the point where he with clarion tones announced that we must reduce the income tax or be arrested for gross cruelty to helpless millionaires.

Reflecting thus I gaze with wistful, envious eyes at Czecho—I sneezed just then and we will let it go at that—the splendid and progressive, poverty-stricken land that can afford to develop aviation and teach its children to be really air-minded, while we on this side, wallowing in wealth, feel ourselves too poor to flap our wings except for exhibition purposes or teach our children anything of flight. The true seat of riches, brethren, is in the brain-pan, not the bread- pan, and Czecho-what you call it seems to have more there than we.

Let's accept the leadership unconsciously extended by the intelligent Czechs and brainy Slovaks.

Yes, gentleman and ladies, boys and girls of the United States, let's emulate the busy little Czecho-Slovaks. We have left too much for George to do and George, apparently, is dead or sleeping. Let's be air-minded. It will be great fun; it will be profitable; it will be comfortable; it will be glorious. You know (some folks forget it) the Wrights were born in the United States!

If we really decide to start on this every one will find in it a pleasant and exhilarating part to play. We must have landing fields, we must have enthusiastic journalists (we have a few—thank God, for instance, for *The Detroit Times* and Frank Bogart) and above all we must have pilots. If we get these things we soon shall have the planes and all the rest of it, in spite of codfish, bullheads, cuttle fish, octupuses, (or is it octopi?) Naval bureaucrats navigating easy chairs and Army cavalrymen riding hobby horses.

I HAVE spoken of *The Detroit Times*. On a recent Sunday it celebrated the second birthday of Bogart's "Aerograms", a department devoted regularly to aeronautics.

Bogart has done good work and had a deuce of a good time. There is a potential Bogart in every newspaper office in America.

In every group of human beings in the country is someone who could take the lead in waking up the country,

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New Jaeger tachometers recording to 2400 or 3000 rpm $6.00
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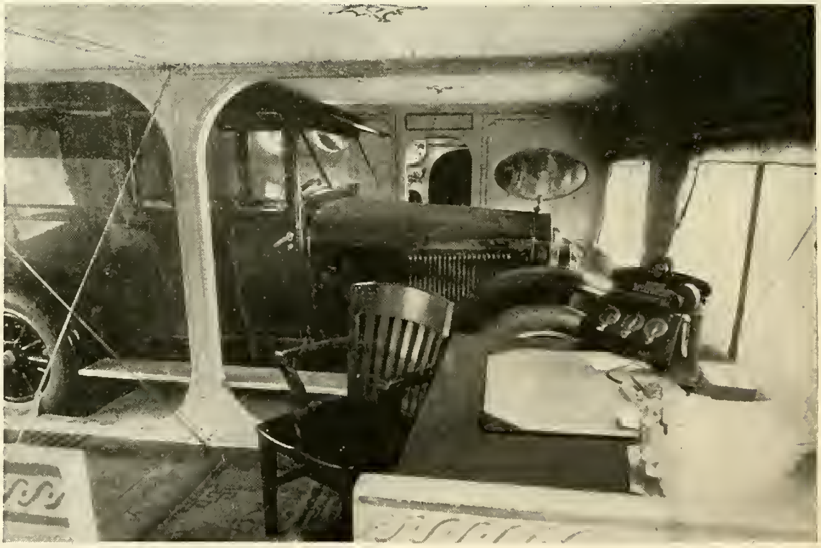

Interior view of RB2 Transport plane as flown with Essex Coach, office equipment and eight men

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making it alert again and safe, adding to its prosperity, helping it to get back its leadership.

Brethren, it's YOUR job. In your own neighborhood there is, for instance, a troop of Boy Scouts. One of them may be the Pershing of the next great war with the nation's fate dependent on him. He ought to know about the vital need of American air-competence.

There are Girl Scouts. In Czecho-Slovakia they would be and doubtless are discussing airplanes.

Magnificent material to work for and to organize exists among both sexes of our youngsters who have not joined up with these great and splendid American Scout organizations—many in every grammar school, high school, academy.

Black experience, as I have pointed out, shows us we can do nothing with the aged and muttonhead. We've got to catch 'em young. These total losses down in Washington might have been assets if they had only had the education. Let's make assets instead of asses of the rising generation.

Give the boys in that Scout Troop an hour twice a month. There's that about the art of aeronautics which will hold them just as tightly fascinated as "Treasure Island" ever held them. And young girls who have athletic older sisters getting from tennis, motoring and the like the best part of their fun, quickly will comprehend that planes will be like motorcars in the near future—as they already are in the more progressive nations of the world like Soviet Russia, Japan and that central European land the name of which looked like a written sneeze when I endeavored to put it down on paper a few moments since.

The boys and girls of every high school will swarm in eager groups, begging for air knowledge, if you'll but let them know you have and are willing to impart it.

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I AM no glittering genius fathering a new and startlingly glorious scheme for saving the United States. The founders of the N. A. A. intended that that organization should make such an endeavor and wrote this intention into their charter, which proclaims it. But the idea took a tailspin in the dark apparently, and never afterwards was found. It must have crashed in the Big Woods or done a nose dive into the deep sea. Like many a good idea which has whiffed N. A. A. poison gas, it's in its grave tonight. Don't cry. It doesn't matter whether that grave's kept green or not. Requiescat in pace. We'll evolve a bigger and a better plan.

What we, who ARE air-minded, are here for is to fly and fly we're going to—for fly we must!

(*Continued on page 256*)

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New wide blade propellers, assorted makes	10.00
New wheels, 26 x 4 or 750 x 125 mm.	5.00
Tires, new 26 x 4 ......$7.50; slightly used	3.00
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Liberty propeller hub, less bolts	3.00
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Hisso Model A crankcase, top or bottom, each	50.00
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OX-5, lower half crankcase	10.00
OX-5, intake pipes, each	.50
OX-5 motor, top overhauled	150.00
Mercedes, 6-cyl. 185 h. p. motor, good as new	100.00
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OX-5 Radiators: Fedders, $7.00, Harrison cartridge core	12.00
Rome-Turney	15.00
New 8-cyl. Berling magnetos	12.00
New airplane spark plugs, each 15c; in lots of 100	.10
New Champion spark plugs, each 25c; in lots of 100	.20
Reconditioned Mosier spark plugs, each 50c; in lots of 100	.40
½" shock absorber cord, per ft. 10c; in lots of 100 ft.	.06
Standard J1 landing gear shock cords, all made up, ea.	1.00
New Oil Gauges, each 90c; in lots of 10, each	.75
Magnetic gasoline gauges, each	1.50
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Extra flexible 5/32" aileron control cable, per foot	.05
Ditto, in 100 ft. coils, 4½c; in 1000 ft. rolls	3½c
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(*Continued from page 255*)

To fly we require facilities, equipment, training. To get them will take organization.

Well, an organization will be ready in the next sixty days.

It will not be controlled by any codfish aristocracy seeking to make our air defense feed an ambition for pre-eminence among pantaletted pussyfooters.

It will not be controlled by Army wire-pullers.

Nor yet by Navy bureaucrats.

All those who have been willing to sidestep the nation's need and safety in order that their wives' tea-parties may glitter with uniforms and their own pockets fill, will be beyond the pale of this new and better organization.

When, in the immediate future, this REAL group is formed, the small, white, moving dots which you will see vanishing into mother earth (not sailing up into the air) will be the cute, astounded, badly frightened tails of the official rabbits, and their brothers the commercial bunnies, diving into any little holes that may be handy.

This, however, is not, and the organization will not be, principally a threat against the fools and rascals; this statement is a promise and the organization will be a safeguard to the patriotic people of this nation. The promise will be kept, the safeguard created.

We must have laws, but we want none which are not exactly right. The nation's progress and our own prosperity and safety will depend on them. The new regu-

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lations set up by the Department of Commerce show the paramount importance of study, watchfulness, earnest and constructive thinking. Flying schools, for instance, now are faced by an entirely new problem which deserves careful consideration. Hitherto it has been possible for a graduate student forthwith to operate his ship and derive income from various sources, such as advertising, surveying and what not. Often this has meant that he must fly from his home state into another state in order to obtain or accomplish his job.

The man who gets a Federal license to carry passengers for hire of course will have to undergo examinations as strict as those made for the Army and Navy pilots. Not only will strict physical examinations be required, but flying tests will be set up and none will get a license who has not done his hundred hours of solo time. Records of safety mean prosperity. These things are absolutely necessary but will need close watching.

All such matters are of life and death importance to the manufacturers, for the majority of ships built have been and must be sold to those who must earn before they pay. Few students have sufficient spot cash to settle for their flying instruction, purchase an airplane and do one hundred hours of solo time.

Is it not obvious that we must seriously get our heads together and work toward a solution of this problem which at present seems to confront the industry?

There appears to be little doubt that if we fail to do something fairly quickly training of new pilots soon automatically will cease and if this happens aircraft manufacture must come to an end.

What Do You Know About Airplanes?

A FEW years ago men had to learn about aircraft from personal, costly experience. They had no one to guide them—no one to point out mistakes when they were made—and therefore years were spent learning what takes months now.

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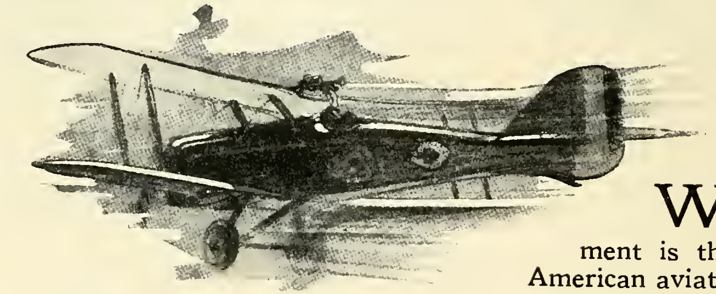

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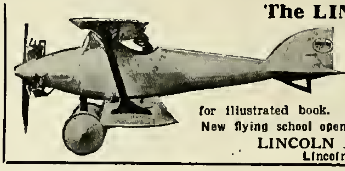

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(Continued from page 171)

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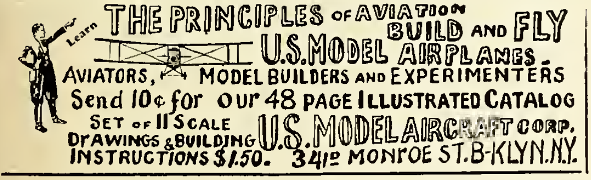

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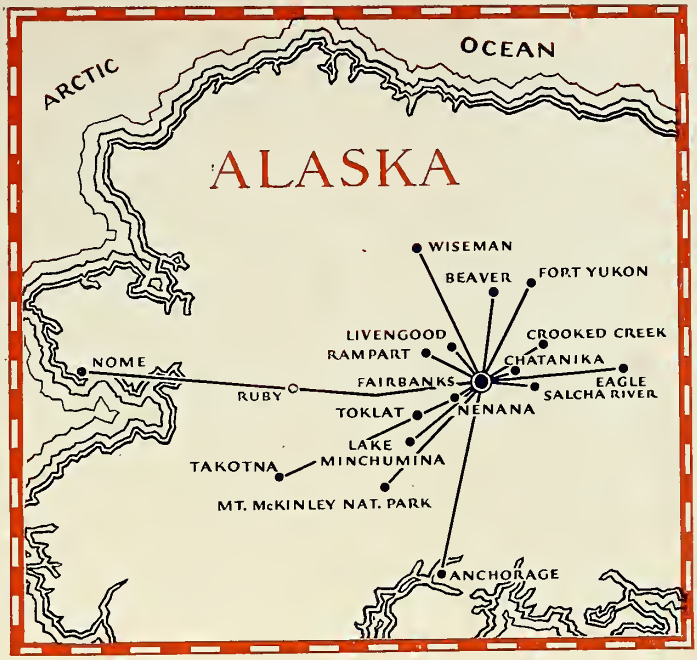

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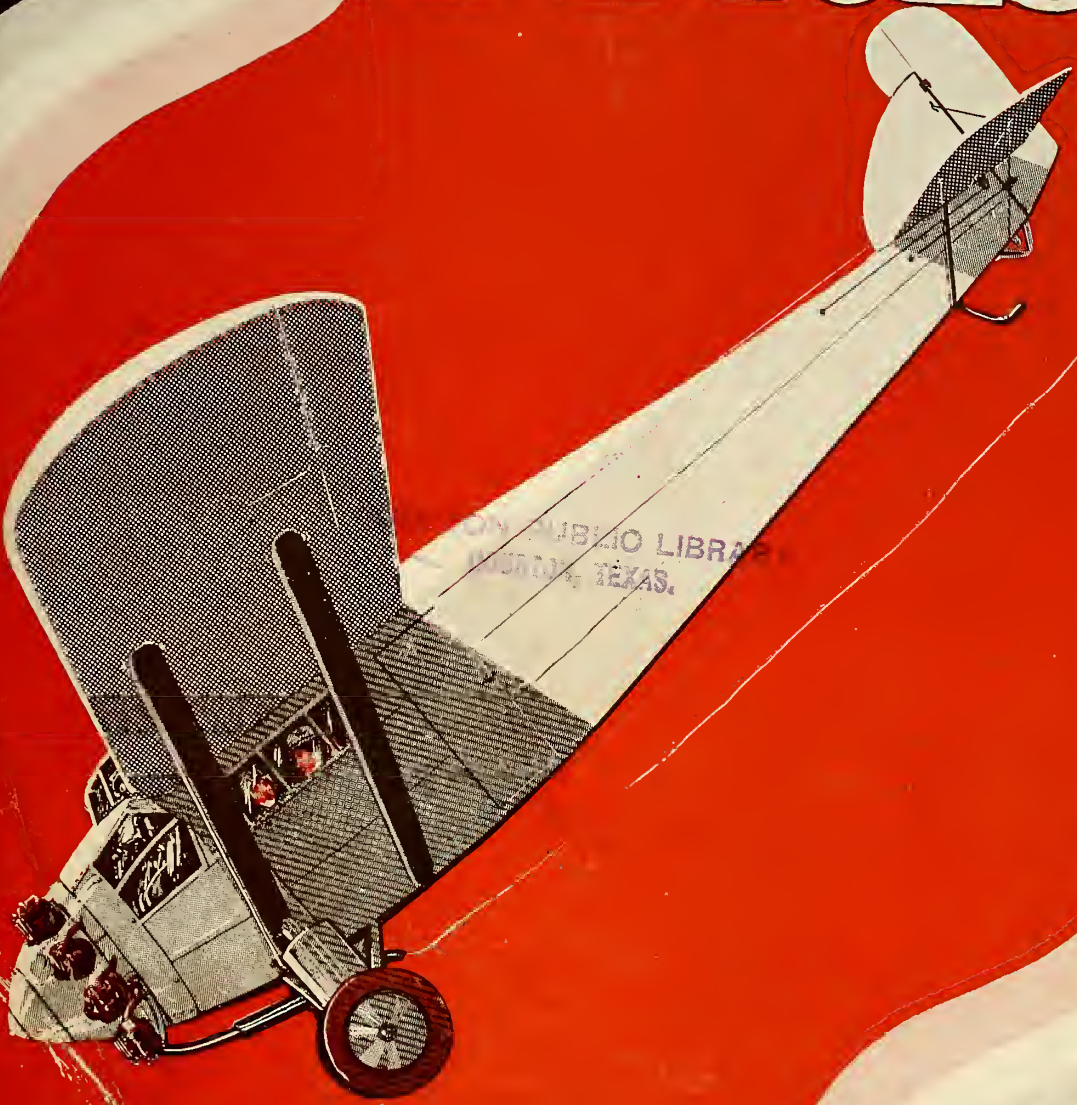

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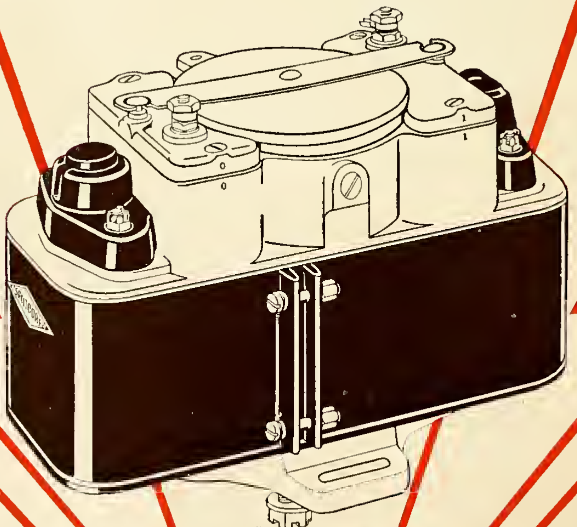

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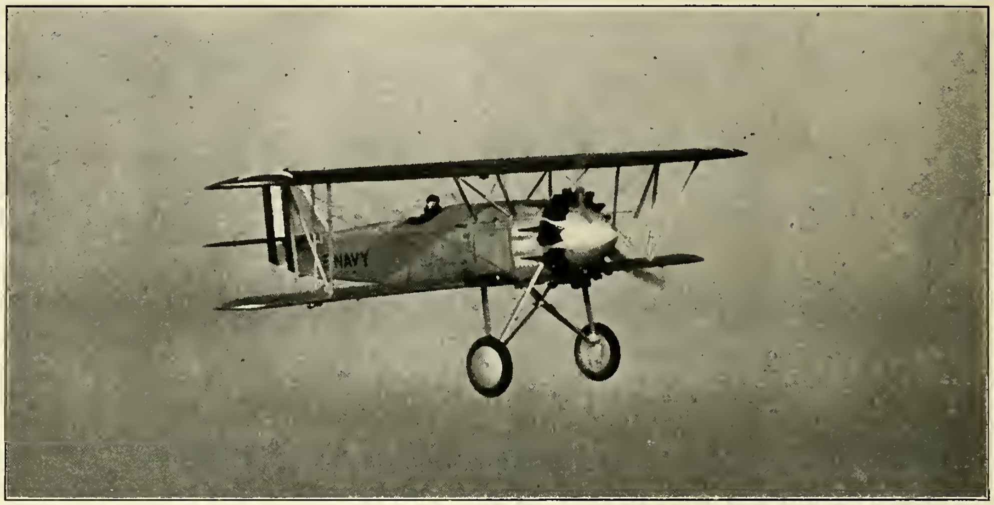

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In August, 1925, Fairchild decided to capitalize its operating experience, and manufacture commercial airplanes. A modern daylight factory was acquired and completely equipped at Farmingdale, Long Island, and an experienced engineering staff organized. Repeated wind-tunnel tests were made at New York University to insure the best aerodynamic efficiency of the plane. The stress analyses were most carefully made and rechecked, so there could be no question of proper safety factors. And before any part was released to the factory, it was approved by Fairchild pilots to be certain it would be easy to service, and practical under operating conditions. The Fairchild Monoplane was tested and successfully flown through the Ford Tour, maintaining the highest average speed of any OX-5 job.. A "Whirlwind" motor was then installed and the plane retested.

The result is a plane which is efficient and practical, built and finished as well or a little better than any other plane in the world and, above all, one which is a real pleasure to fly. It is stable under all conditions of load, handles quickly and at the same time easily. When stalled, the nose settles with no tendency to fall off on a wing. Practical experience taught us that part of the fatigue of flying was due to wind and cold, so we put the pilot inside, and yet managed to give him a range of vision, that is found in but a few open cockpit jobs.

For the first time real quantity production methods are applied to a commercial plane. Fuselages are welded from standardized parts in heavy metal jigs. Fittings are stamped out on 5-ton presses. This method of manufacture provides a quality and interchangeability of parts, which cannot be obtained in hand-made planes. From May first production will be one plane per week.

Our policy is quality first, production later. For this reason it has been impossible to increase production to meet the demand. The first plane goes to a private owner in Denver, two and three to the Curtiss Flying Service, four to the Department of Commerce, five and six, on floats, to Canada, seven to Mexico, eight and nine for our own demonstrators. Production will later be increased to two a week.

Back of the plane, the engineering, the manufacture and the testing stands the Fairchild Aviation Corporation, an organization of 150 men and a paid-in capital of $579,500, with seven years' successful growth in the aviation industry. Its name and reputation insure you of workmanship, service and value.

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AERO DIGEST

THE MAGAZINE OF THE AIR

Vol. 10 No. 4

APRIL, 1927

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Phone: Wisconsin 3771. AERO DIGEST Cable Address: AERODIG.

is published monthly by

THE AERONAUTICAL DIGEST PUBLISHING CORP., 220 West 42nd Street, New York City

Frank A. Tichenor, President.
A. Horsfall, Vice-President.
K. Healy, Secretary.

J. E. Horsfall, Editor.
George F. McLaughlin, Associate Editor.
William A. Rogers, Advertising Manager.

LOS ANGELES OFFICE: 1129 Mohawk Street. Frank Samuels, Representative. Phone: Dunkirk 6332.
PHILADELPHIA OFFICE: 1013 Commercial Trust Bldg., S. E. cor. 15th and Market Streets. Phone: Rittenhouse 3247.

Single Copy 25c. Yearly Subscription $3; Canada $3.50; Foreign $4.

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Entered as second-class matter July 17, 1922, at the Post Office at New York, N. Y., under the Act of April 3, 1879. Copyrighted, 1927, by Aeronautical Digest Publishing Corp.

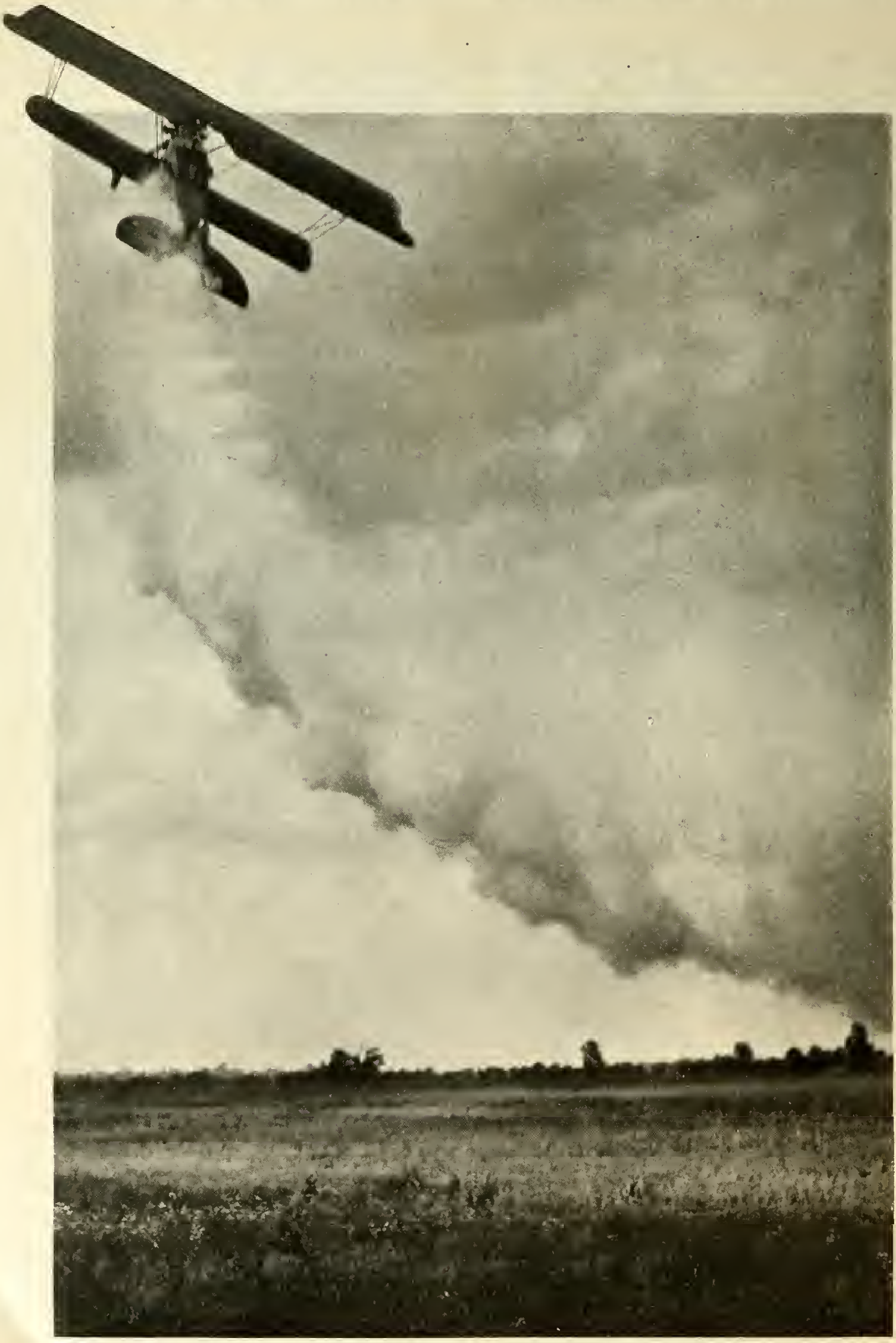

Photo courtesy U. S. Dept. of Agriculture.

Fighting the boll weevil. Flying back and forth across the fields, swooping down over trees at one end and climbing over the trees at the other, the dusting airplane spreads a cloud of poison-laden dust 200 feet wide, at the rate of 75 acres per minute

THE NEXT PARADE

By

James Warner Bellah

THAT last morning before, there were two things to shake the skepticism of the laughing doubters of the past weeks. In the papers the black roaring headlines—ULTIMATUM. And in the mails

"Subject: Immediate Accessibility.

"To: All reserve officers.

"It is imperative that all reserve officers in the Corps Area immediately communicate home, office and all other telephone numbers which will locate them at any time of day or night, within fifteen minutes. Official."

People read the papers in subways and shook their heads meanwhile little cold prickles chased lightly up their spines and tingled in the joints of their jaws. "Low exchange", "Years of economic pressure", "Inevitable result", "Mexican infiltration", "the Philippines", "—demand International Garrison in Canal Zone", and there they stuck. Who built the canal anyway? Who made it possible? Where did any European country get the consummate nerve to poke a nose into a straight Pacific issue? What about '17? Suppose the United States *is* the richest country in the world, do they think they're going to get something for nothing? If they do—let 'em try!

At the armories there was very little "if" in the talk. By nine o'clock, the officers commenced to report in casually and to telephone their offices not to expect them. By ten, additional recruiting signs were out to fill up the complements to war strength unofficially. By eleven, there were stacks of telegrams in the adjutants' offices at the 71st, 7th and 69th—telegrams and cablegrams from as far as Guam and Siberia. Old members. "Hold a place."—"On my way." They took it for granted, those men. And as the subway crowds passed the different armories in their goings and comings through the City, they too began to take it for granted.

An anti-aircraft gun here with a sergeant talking quietly from the truck seat—a machine gun there with an officer showing the working of it—stripping it in thirty-five seconds for the benefit of a gaping crowd.

"Go ahead—it's only the militia. If the Ultimatum doesn't expire—no harm done—one night a week."

Quietly and insidiously minds turned. An indignity—a frame-up, if you will. Perhaps it was inevitable, but all the man in the street saw was the dirtiness—the injustice of it. A rock had been thrown at him when his back was turned.

Even in the churches—at St. Patrick's and Trinity, there was this same note in the special noon services. "Let there be thought before action. Let there be contemplation rather than hysteria. Let there be trust in Washington and faith in the dozen men who have to answer for the country. But let us not forget that we are the insulted party—that right is with us. That this great western civilization is ours. That——"

This great western civilization. At luncheon at the Harvard Club, someone rose and quieted the babel of conversation for a moment. "It's the end of the march 'round the world! The march of civilization from east back to east! We're knocking at the backdoor of the house we started from. We've been knocking for years. To-night at midnight the knock will be answered. Where can we go even if——"

"Never mind where we can go," someone laughed, "by midnight we'll be on our way."

And someone else—someone who had been in the Harvard Club that other morning in April, fifteen years before—"trouble is—in the march—we didn't mop-up in Europe, or we wouldn't be caught in a vise today!"

At two, there were vague extras on the street. Ten thousand men at Scofield Barracks, Hawaii safe. The Canal is safe. Everything is safe. Where is the fleet? No decision yet from Washington.

Governor's Island had worked all the night before recalling from leave, planning the reserve fabric. Governor's Island was still working. At noon the Corps Area Air Officer telephoned the O. C. Mineola and suggested an exhibition flight to buck up civilian morale. An hour and a half later, thirty-four planes circled across the Battery and roared up the Hudson River to 125th Street and back down the Harlem to 42nd Street. People stopped and looked up in black throngs. And certain young men in the crowd had high lights in their eyes and little tugs at their hearts. That's an answer! Answer to the whole question. Thirty-four planes is supremacy to the man in the street. Is he expected to know types and air speeds?

But at Mineola afterwards, they cursed, for they knew of the tests made three months before in Denmark—in Denmark for secrecy. Knew that they'd been sold out again by the blind, honest emotions of that same man in the street. What is two hundred miles an hour when the hush Falcon tests in Denmark showed three-seventy-five on the level, with a five and a half minute compression helmet climb to 30,000 feet? And cursing, they drained carburetors and sumps—drained them for some unknown reason and refilled. The Country would owe something to the O. C. Mineola before morning, for those refilled sumps and tanks—for his gunnery orders at three of that afternoon before. . . .

At the same time that Mineola press-agented, the Navy yard got to work to ease people's minds. A destroyer division crept up the Hudson from somewhere to Grant's tomb and anchored in-shore, with civilian morale aforethought. People going home on bus tops saw it at five-thirty and nodded in stupid satisfaction and tightened their jaws a little harder. This was America after all. There could be an answer if there had to be. See—the fleet is already anchored in the Hudson!

They had read the papers.

The fleet was doing eighteen slugging knots northward under forced draft from Guantanamo where it had purposely been allowed to go before the Ultimatum was delivered.

New York settled down in its cubby holes and ate its steak and French fried potatoes, kissed its wife and drank its coffee and read its evening newspaper. And just as it turned to the sporting page a little dried up Major General on Governor's Island read a slip of paper and turned as white as the paper in his trembling hands. His Adjutant spoke tersely.

"It's flat, sir. With confirmation. The *Leviathan* got it and the relay passed through the *President Harding* with further confirmation. The *Harding* is eastbound three hundred miles west of the *Leviathan*. They saw it too, sir."

"But, my God! Get me Mineola. This thing can't be!" The General ran his hand across his forehead and reached for the waiting telephone. "Hello. See here, Mineola. What's flying time for the Atlantic?"

There was a click and a quick intake of breath at the other end of the wire. The O. C. Mineola's fingers tightened upon his telephone receiver. "Official time, sir—or what it can actually be flown in?"

"Actually flown in."

"It can actually be flown in twelve hours—with D. W. Mammoth's—what *they've* got. Have they started, sir?"

"Yes," barked the General. "I have confirmed relay from Intelligence. The *Leviathan* spotted them and radioed before she was struck. Formation not counted but estimated at between 1,500 and 2,000 machines."

"That is *one* formation."

"What do you mean?"

"Listen, sir—I beg you now—forget my rank for a moment and listen to me. We've held this thing possible for two years and we have it thoroughly doped out. We know. It's been our business to know. We do know. The Ultimatum will be thrown down at midnight. By two o'clock, the Atlantic seaboard cities will be thoroughly egged—bombed. Gas and H. E.—to paralyze the nerve centers of commerce and to strike at civilian morale. That's why I say that's *one* formation. There'll be at least two more—a northern and a southern."

"But it's madness!" yelled the General. "Where'll they base after they hit?"

"Where's the fleet?" asked the O. C. Mineola. "Pick up your shipping news for the past week, sir. Look at the registry of tramps and freighters within eight hundred miles of the coast. These ships the *Leviathan* spotted will have reserve gas enough to go back a thousand miles to sea after they strike. They'll be picked up and refilled at sea by every kind of hush ship imaginable."

"But if the Ultimatum is accepted?"

"They'll know—by radio—before we do. They'll probably strike just the same or they may circle back and call it maneuvers. I think they'll strike."

"Why?"

"To split the country—to draw attention to the Atlantic—to draw the Fleet. They're drawing it already from Guantanamo—so that the real blow can be struck in the west. What do you think Europe is in this thing for anyway? To make sure of knifing us—to decoy us from the main trouble! It's as plain as day."

"Can you break this thing—as far as the corps area is concerned—New York?"

The O. C. Mineola laughed harshly. "Can a fish play checkers? I'll fight and I'll do my best, but you'll need thirty-four replacement pilots in the morning. One thing more, sir. I'll want infantry here to hold the airdromes—all the airdromes. It won't do to have them base on us—after we're gone."

"You'll have it——"

"And I'll want all my reserve pilots before ten o'clock."

"Right. And you'll have the guns to help."

"What guns?"

"Anti-aircraft."

"For God's sake, sir! Tell 'em what our markings are and don't let them spill stuff at every motor they hear. We'll have enough trouble."

The connection clicked off and the General sat for a moment between indignation and a vague feeling of panic. A young man—suppose he is right? He turned. His Adjutant placed a second piece of paper before him.

"You will act as if air-raid were impending. Order will be preserved at all costs. Actual damage will probably be slight. Civilian population is to be warned and allowed to evacuate to open country. Gas respirators are to be issued where possible. Precautions are to be taken against incendiary bombs. Evacuations to be started at once."

For a moment the General stared—his mind floundering like a man slipping on thin ice. Then suddenly he *knew*. "But, my God," he burst out. "That's all right for Boston and Philadelphia—but we're on an island here—bottled up!"

"Yes, sir," said the Adjutant.

The General stood up suddenly, the cold blood frozen in the palms of his hands.

"It's true, then! They expected it. It's as plain as day. If the Ultimatum is rejected, they strike. If it's accepted, *they'll* know it by radio before we do! Radio. Get all broadcasting stations and shut them off at once. Get me police headquarters. I'll want all lights out—no theatres. Who was it that said, 'War was a man going somewhere on his feet?' This won't be war, it'll be hell! Get me the Navy Yard. I'll need marine patrols in all parts of Manhattan immediately. Police will take care of the outlying parts. Get me Wadsworth and Totten and the Hook. Get me the Governor. I haven't enough troops to keep the City from rioting if this thing is true. Get me——"

"Yes, sir," said the Adjutant. "And after midnight—no current on in the subways. People will run there——"

The Adjutant's lips trembled slightly. He seamed them together. "To get away."

"Get me the Fire Commissioner," said the General, "and the hospitals—and find out from the post hospital the quickest way to improvise gas respirators—start the hospitals doing it."

"Yes, sir," said the Adjutant.

"And the drug stores——"

AT eight o'clock, New York turned from the sporting page to the radio—and turned whiter than the General had. There was only one voice on the dials—a cold droning voice.

"There is to be no disorder. If you want to go—go quietly. There is plenty of time—plenty of time to get away. The marines and police are to be obeyed implicitly. Take no orders from any unarmed soldier. The damage will be slight. Those who stay should provide themselves with gauze pads for nose and mouth, saturated with phenophalepthaline. Those who go should lock everything carefully. Property will be guarded religiously. Those who live in uptown sections take Fort Lee Ferry and Westchester trains—Westchester trains. Downtown district take Jersey ferries and Long Island trains. There are to be no window lights after midnight and no loitering in the streets. If you are going—make your plans now and keep moving. Remember—there is plenty of time—plenty of time to get away. Let there be no rioting or disorder of any kind. The subways will cease to run after midnight and all street lighting will be shut off. All house lighting is to be shut off simultaneously with the extinction of street lights. Remember the streets are patrolled with men to enforce these rulings. Let there be no disorder—no panic—no hysteria. Remember—there is plenty of time—plenty of time to get away."

New York stared. New York stood up. New York clenched its fists and swore between its teeth. New York laughed. And presently, here and there New York packed a bag and departed slowly—while there was plenty of time.

And again the four grim Horsemen mounted their lean flanked beasts and galloped to the thin wail of the trumpets. And before them, well in advance, went their Herald—Panic. Prodding, probing, whispering into doubting ears. "Perhaps there isn't plenty of time. Get along there! The subways don't run after midnight." And presently, not satisfied with his work, Panic uncoiled his bloody flail and lashed it singing above men's heads. The first people to go were well on their way by nine-thirty, and the first skeptical doubters had packed hastily and followed them. The streets were filled with long lines of shuffling people—still laughing at the absurdity — but not for long. It was impossible to get a taxi. One had to wait in line at the subway stations. People were buying places for their women and themselves. Street cars were crowded. And still not half the City had decided to go. Hours yet—and no disorder so far.

But as the time grew shorter, still more of New York departed until at ten-thirty the marines at the ferry houses fixed bayonets with a cold rattle of metal—and a man was shot between the eyes at the 72nd Street subway station. As a warning he was left there at the entrance lying in his half-opened fur coat with his mouth gaping in astonishment. Left as a quiet indication that people must proceed in single file and quietly, and not knock old women down. He was a fat man and his coat was lined with sable. His friends attacked the sergeant who had fired the shot. The sergeant drew back his lips and emptied his magazine in the bored manner of a man who is too busy to be bothered with childish prattle.

"Take 'em out—and don't cover 'em up!" he said. "Keep movin', you people! Never mind what my name is. I'm no street car conductor. Get on there through them turnstyles. The first one of you who stops or tries to push ahead gets one. All right. Enough on the platform! Hold hard until you hear the whistle blown. Single file. I don't care about your wife, man! I've got one of me own somewhere with no one to look out for her either. This is war!"

And again Panic cracked his flesh whip—and this time it lashed into faces and stung and blinded.

Fifteen minutes later the mob trampled the sergeant and rushed the 72nd Street station. Rushed it by sheer force of numbers. They stampeded hopelessly, trampling each other and choking the stairways till people's faces turned black and they suffocated on their feet.

It took a machine gun company from the 7th to clear out the struggling masses. They arrived in taxicabs and raked Broadway and the side streets with bursts of ten shots until the rioting stopped. Then they fired into the maw of the station and cleaned out the charnel, piling the bodies on the southbound tracks. The subways must run—at all costs! The subways *did* run. Sluggishly but steadily taking people northward to the open country.

At Grand Central, the 71st had machine guns at all the approaches, and now and again one barked as a warning that law and order would be preserved at all costs.

Further south—conditions were hideous. By eleven o'clock all hope of a decent orderly evacuation was gone. In West Street, the marines and police had been forced into second story windows. The street and dock entrances were black with a struggling horde, babelling in every tongue known to God or man. Tugs, barges and ferries were taking full loads to the Jersey shore, but still the crowd roared and

(*Cont. on p.* 356)

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WHAT THE SIXTY-NINTH CONGRESS HAS DONE FOR THE AIR CORPS

By W. Frank James, M.C.

12th District, Michigan, Member of Military Affairs Committee

Congressman James' activities in behalf of the Army Air Corps commends him to everyone interested in aeronautics

WHEN the 69th Congress convened in December, 1925, one of the most important problems confronting it was making proper provision for the air defense of the United States. For several years this matter had been the subject of discussion. Many investigations had been undertaken. When the Military Affairs Committee of the House determined to prepare appropriate legislation it had the report of the Special Committee of the House of which the Honorable Florian Lampert was chairman. This was based upon a long and thorough investigation involving the examination of many witnesses, the taking of a great mass of testimony.

The Military Affairs Committee had likewise the report of the Morrow Board, which with its recommendations had been transmitted to Congress by the President. This was a special board convened by the President, composed of representative men who made an independent study of this problem of air defense.

The Committee on Military Affairs conducted hearings of its own, went into the subject with great care, studied all of the recommendations which had been placed before it, and as a result of this work formulated a Bill, H. R. 10827, which, to use the wording of its preamble, provides more effectively for the national defenses by increasing the efficiency of the Air Corps. This Bill became law when signed by the President, July 2, 1926.

This legislation, now commonly called "The Air Corps Act" changed the name "Air Service" to "Air Corps"; provided for an additional Assistant Secretary of War with the intention that his major duty should be the dealing with air matters; and provided for the proper representation of the Air Corps on the War Department General Staff. Other minor changes in administration were included in the Act, but its most important sections provided for a substantial increase in personnel and equipment.

This Act authorized a continuing five-year expansion program. At the end of that period, assuming that appropriations are made to put this program into effect, the Air Corps will consist of 1,650 regular officers, 15,000 enlisted men, including 500 flying cadets, and 550 reserve officers on active duty. When the Act was passed there were in the Air Corps only 919 officers, 8,578 enlisted men, and 142 flying cadets. The Act also provided that at the end of the five-year period the Air Corps would have 1,800 new planes of the most modern types and further authorized the maintenance of these planes by the annual procurement of some 400 planes.

This Air Corps Act was passed at the first session of the 69th Congress. While it provided no additional appropriations it did authorize the submission of supplemental estimates to cover the cost of the first of the five annual increments.

When this Congress reassembled in 1926, it became apparent that even if such supplemental estimates were submitted it would be some time before the necessary sums could be made available and that little could be done during what would be left of the fiscal year 1927. It was therefore decided that it would be impracticable to do much toward the increase of the Air Corps during this year and that the additional sums needed would be included in the regular Appropriation Bills, some parts to be made immediately available with the intention that actually the first increment of the Air Corps would be added during the fiscal year 1928.

During this second session, just ended, a total sum of $21,891,300 was provided for expenditure during the fiscal year ending June 30, 1928. Provision is thus made for the purchase of some 500 airplanes for the regular Air Corps. The total estimated cost to provide these planes, and an additional 80 planes for the National Guard is $12,005,050. These will all be new planes of the latest designs. Contracts for their construction will be let at an early date.

A proper provision is made in the Army Appropriation Bill for the increase of the Air Corps enlisted personnel during the fiscal year 1928 by 1,248 men. While the Air Corps Act authorized the addition of 403 commissioned officers of the Army, in view of the fact that the Air Corps was already short of its authorized number of officers, no provision was made for any part of this increase during the fiscal year 1928, the expectation being that this shortage would largely be made up by the transfer of officers from other branches. The War Department circularized the Army with the view of securing applications for such transfers, but the number received is less than expected. Unless more such applications are submitted during the fiscal year 1928, some other provision must be made for obtaining the officer increase authorized by the Air Corps Act.

Sums appropriated for other purposes are: $2,200,000 for experimental and research work; $200,000 for the purchase of helium; $275,000 for lighter-than-air equipment; $1,062,935 for technical construction and improvements at Air Corps stations.

The measure also enables the War Department to call 110 additional reserve officers into the service for active duty and provides for the training of other reserve officers by giving them approximately 17,000 flying hours.

The Military Affairs Committee made a detailed study by one of its sub-committees of the methods employed in the procurement of aircraft. The Committee of Naval Affairs joined in this study.

(Continued on page 347)

ANOTHER FASCIST TRIUMPH

P. & A. Photo.

The Savoia "Santa Maria" flown by de Pinedo.

THE achievement of de Pinedo in flying over the South American jungles is perhaps more than any other measurably similar adventure an evidence of the airplane's vast importance as a pioneering vehicle. The poisonous snakes, stinging insects, malaria-laden air of the mysterious tropic wilderness meant nothing to this man who buzzed above them at a speed unparalleled by any of the strange birds which doubtless fled in wild alarm as he amazingly approached.

Probably the frightened savages who gazed at him as he swept across their skies, believed him to be some mighty god and fell in fear among their thickets utterly appalled, expecting magical and most likely dreadful manifestations of his power. Very likely they still are chattering in their ill-formed, crude languages wondering with half-developed minds, devising silly charms, muttering incantations. The magic of the white man!

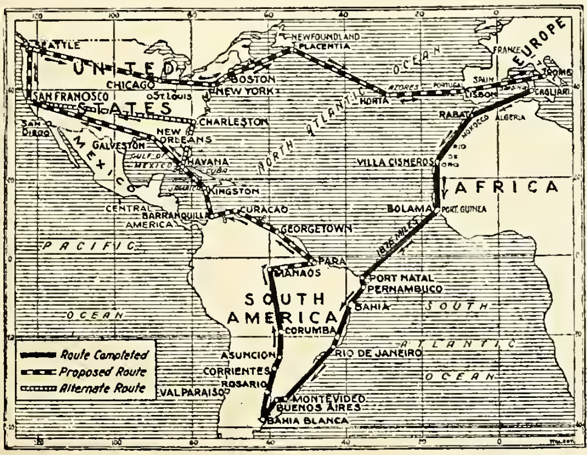
P. & A. Photo.

De Pinedo supervises the loading of fuel.

Among the white men, themselves, there is too slight appreciation of the amazing magic de Pinedo found it truly possible to apply on his epochal transatlantic journey.

His flight began at Cagliari, a town in Sardinia, February 13, the patron day of good St. Valentine, love's patron. Surely the de Pinedo flight has drawn friendly and approving if not necessarily affectionate attention to the Fascist Government of Italy—which thus again has shown startling enterprise.

His first day's flight covered a good thousand miles and landed him at Rabat, French Morocco. Another thousand miles was covered the next day, which took him to Villa Cisneros, West Africa, and then to Bolama, in the Portuguese Possessions, from which point he had intended to spring straight across the sea to Port Natal, Brazil.



Courtesy N. Y. Times.

Map showing route taken by Commander de Pinedo.

Here, however, the effect of a miscalculation hampered him. He could not get his plane into the air with a load of fuel sufficient to carry him upon a non-stop transatlantic flight. But this did not seriously delay his enterprise. He merely changed his plan and with a lighter weight of fuel found it possible to fly to Dakar, in French Senegal. Thence the 300-mile hop to the Cape Verde islands was a simple matter and from the Cape Verdes he sprang into a flight which should have taken him to the South American mainland and in fact virtually did so, but he could not land, and flew back to the Island of Fernando Noronha, whence, later, the journey to the mainland was an easy matter.

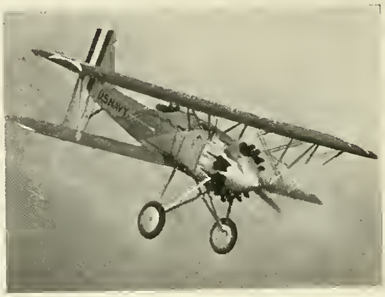
Down the west coast of South America to Rio de Janeiro and Buenos Aires, he flew. Then up to Montevideo, Corrientes and Asuncion. Above Brazilian wilds he disappeared for a full day and night and doubts were entertained as to whether he had managed to survive. The whole world of people interested in air navigation breathed a deep sigh of relief when the brave Italian was at length heard from.

It is estimated that when Commander de Pinedo ends his journey he will have flown approximately 30,325 miles. His program includes follow-the South American coast and hopping thence to the West Indies, wherein the Bahamas and Cuba will be important stopping places. Then he will cross to Florida, then to Charleston, S. C., or to New Orleans, La. From either one of these cities he will make a straight line flight across the southern part of the United States making intermediate stops where there are air fields and then work to the far West with San Francisco and Seattle definitely on his Pacific Coast list, while it is hardly probable that the motion picture land of Southern California will fail sufficiently of enterprise to let him stay away from its beauties—scenic and financial—and light—that of the sun and that which illumines the studios.

Commander de Pinedo arrived at Para, Brazil, on March 21, meeting the United States Army Pan-American flyers who landed there the same day. Although both the American flyers and Commander de Pinedo were bound northward from Para to the United States, their routes were not identical. The Italian flyer's route carried him to Georgetown, British Guiana, Curacao in the Dutch West Indies, Kingston, Jamaica, and Port-au-Prince, Haiti. He arrived at Havana, Cuba, on March 28 enroute to New Orleans.

THE CURTISS SEA HAWK

By
Cy Caldwell

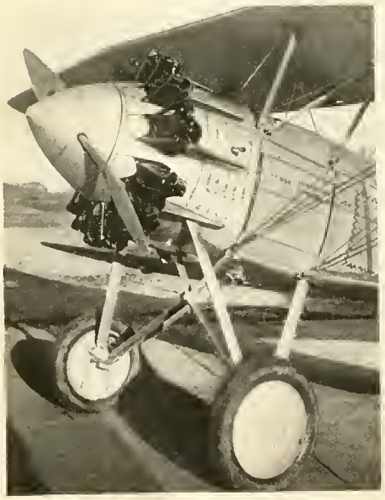


THE Curtiss Sea Hawk, or F7C-1, is a single-seat shipboard fighter, powered with the Pratt and Whitney "Wasp" aircooled engine of 400 h.p., and designed for the U. S. Navy. It is a tractor biplane, and in appearance retains many features of the highly successful Curtiss Hawk and Falcon types. It has all the earmarks of an eminently efficient and useful fighting airplane, which should recommend it strongly to the Navy, and, in addition, it has the further merit of being the cause of my being invited to lunch by the Curtiss Company, which recommends it strongly to me. In fact, I may say candidly that I have a feeling of affection for this plane which I have for no other at the present moment, and that if ever my good wishes accompanied a plane on its flight into the troubled air of Navy procurement and did the plane any good, they are certainly riding right along with this Curtiss Sea Hawk.

But I want to tell you six readers all about this fine plane, and also about the good time I had out at Garden City on March 11, when Temple Joyce, the company's test pilot, rolled, looped, spun, dived, zoomed, and generally put the Sea Hawk through its paces—and they're quite some paces, and Temple is some pilot. Of course, this business of describing new airplanes could be handled better by George McLaughlin, the technical editor, but George couldn't go out that day—and I needed a lunch more than he did—so I have to tackle the job of describing the plane. But I'll have to do it my own way, as the old lady remarked when she got on the horse backwards, so you folks just bear with me.

To begin with, Frank Russell the vice-president of the Curtiss Company, called up and invited Frank Tichenor and George and me to go out to see the plane and have lunch at Garden City. Well, I was anxious to see the plane, and as it was Friday I figured they'd probably have fish—Long Island being surrounded by fish—and I'm fond of fish. So I said at once, "I certainly want to see that new Curtiss Sea Hawk, Frank. Let's go." So out we went—and all I'd had was a cup of coffee and a doughnut, the standard breakfast of semi-literary men—and I was keen as mustard to see that plane and get started on the lunch. That is to say, I was very anxious to see the plane, as you can well imagine.

Well, Frank Russell met us in his car, a handsome limousine which I took to be a Rolls-Royce, only I discovered later it was a Cadillac with one of those Rolls-Royce silver radiator figures on the front of it—I suppose he'd been parked near a Rolls one night, but I don't know. Anyhow, we rolled up to the Curtiss plant, a building somewhat resembling the Library of Congress in Washington, only larger and more honest-looking, where I was introduced to Mr. Beisel, one of the engineers of the company, and a most interesting man to listen to if you weren't hungry. He took me out to show me the Sea Hawk and tell me all about it.



View of the new type oleo landing gear.

"Probably the most interesting feature of the F7C-1, or Curtiss Sea Hawk—be sure you get the name right—" he began, "is the landing gear, incorporating, for the first time in any airplane, hydraulic wheel brakes and oleo shock absorbers wholly within the landing wheels. The shock absorbing medium is a combination two-cylinder oleo and rubber disc type, providing smooth and easy action with no tendency to rebound. The wheel is of the disc type, with the hydraulically operated brake shoes bearing on the inner surface of the wheel rim. It is expected that the wheel brakes will be particularly valuable in making shipboard landings, as well as in improving the taxying qualities when operating on land. Another new feature is the use, for the first time, of an oleo-disc tail skid. On other airplanes equipped with oleo landing gears, the criticism has made that while the bouncing action of the wheels has been eliminated, the bouncing of the tail skid has been ever more apparent. The oleo skid eliminates this criticism."

Well, I thought to myself, that's all very interesting, but when do we eat? I mean to say, I was intensely interested, but I can always get up more interest on a full stomach. However, the engaging Mr. Beisel went right ahead, full of enthusiasm.

"This airplane," he said, "can also be equipped as a single float seaplane for ordinary water operation. The float used in the seaplane version of the F7C-1 departs somewhat from usual American practice, having a rather steep concave Vee-bottom forward of the step. It is expected to show improved take-off, taxying and landing characteristics. The machine can be catapulted with either type of landing gear, a new feature in fighting planes.

Temple N. Joyce, Curtiss test pilot.

"The fuselage of the F7C-1 is a combination of duralumin and steel tubing, with steel fittings, and as noted above is designed to take catapult and decklanding loads. By the use of this structure the Curtiss Company has been able to produce a fuselage that compares favorably in weight with the standard "Hawk" fuselage, in spite of the heavier loads. The riveted duralumin construction presents a great advantage over welded steel in the matter of field repair. With ordinary tools such as a hacksaw, hammer, file, and center-punch, it is possible to remove and replace a damaged member in the field, a feat which is impossible with welded steel fuselages. The detachable engine mount uses a steel tubular ring and struts."

"Well, Mr. Beisel," I remarked, "that is certainly ingenious. How often I have wanted to take my airplane apart and put it together out in the field, merely for the intellectual thrill of the thing. I shall have to get me one of these Curtiss Sea Hawks, if only for the fun of working on it with a hacksaw, file, and center-punch—and if there's one thing more than another I love using it's a center-punch. The ticklish business of keeping the punch right on center is highly diverting."

"I suppose it is," he replied, looking at me rather curiously, I thought—probably because I displayed so much intricate knowledge, "but as I was saying when you got mixed up with that punch—in order to obtain the maximum possible forward vision which is a prerequisite on a shipboard plane, it was necessary to provide eleven inches of adjustment on the pilot's seat. With the seat in the full-up position, it was found that the pilot would be unable to reach the rudder pedals. To overcome this difficulty, an ingenious arrangement has been provided whereby the pedals operate on slides, and automatically move back as the seat is raised. In addition, the pedals can be independently adjusted to suit the individual pilot, by means of a hand lever. On getting into the cockpit, therefore, the pilot adjusts the pedals to suit himself, and thereafter the pedal distance remains constant no matter what the position of the seat. Small auxiliary pedals control the action of the wheel brakes. All controls, including guns and bomb releases, are easily operated with the seat in any position. The cockpit floor is provided with a glass window as an aid to vision."

"And if there's anything I like in an airplane," I remarked, interrupting his really splendid flow of language, "it's good vision. I've always wanted to look through the floor of an airplane, and never could do it—although I've stared and stared. By the way, where are they holding that lunch? We don't want to be late, you know. Airplanes last quite a while, but lunches get cold and all that."

"Plenty of time for lunch," said the hardy fellow—I suppose an engineer can afford quite a substantial breakfast. "Plenty of time for that. I want to tell you about the safety devices."

"Go ahead," I said bitterly. "Tell me all about them, Mr. Beisel."

"To minimize as far as possible the fire risk, the fuel tank has been provided with a large dump valve. In an emergency the pilot can open this valve and drain all his fuel within a few seconds. This dump valve presents an advantage over the ordinary droppable tank in that its satisfactory operation can be easily tested at regular intervals. Furthermore, if used in an emergency, it does not damage or injure the plane in any way, while the release of a droppable tank of course means that the airplane is out of service until a new tank is fitted. Additional safety is provided by keeping all fuel piping out of the pilot's cockpit, and by a pressure type of fire extinguisher carried in the engine compartment.

Throughout the plane, particular attention has been paid to accessibility and easy maintenance. All cowling is quickly detachable in small sections, employing a new flush type of fastener which can be released with a quarter-turn of a screwdriver. Top and bottom covering on the fuselage can be quickly removed for inspection of fuselage members and controls. All moving parts are provided with alemite connections to insure proper and easy lubrication. An ingenious tool box, containing all necessary tools, starting crank, log book, and a first-aid kit, is conveniently located on the side of the fuselage."

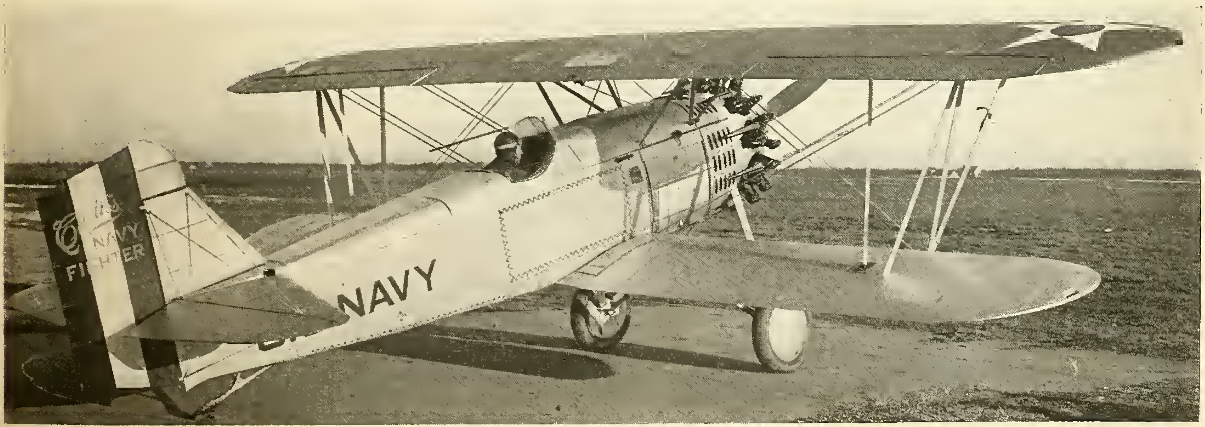
"And where did you say this lunch was located?" I inquired. "Your mentioning the first-aid kit reminded me of it. I believe I'm going to need first-aid very, very soon, Mr. Biesel."

"I believe it's at the Garden City Hotel," he replied. "Now the wings are—"

"How far is that from here?" I asked. "You know, I want to figure out if I can last that long."

"These wings are built to last," he rejoined brightly—honestly, I never saw a man with so much endurance. It seemed he could go on forever, like Phillips' brook.

"The wings," he went on, "are of typical Curtiss construction, with spruce box beams and ribs. The wing curve used is the C-72, a new airfoil developed in the Curtiss wind tunnel. The wing arrangement combines pronounced forward stagger with seven degrees of sweepback in the upper wing. The cut-out required in the upper wing for good vision in the usual fighting plane decreases the efficiency of the wing to a (*Continued on page 342*)



The Curtiss Navy Fighter, type F7C-1 "Sea Hawk," powered with the 400 h.p. Pratt & Whitney "Wasp" engine.

AIR—HOT AND OTHERWISE

Atta Boy, Bill!

Good Will—We May Need It!

France Knows!

Less Politics—More Action!

Frank A. Tichenor

THE Department of Commerce Aeronautical Branch, of which Bill MacCracken is the head, deserves the thanks of all engaged in the production of aircraft in America. AERO DIGEST loves to wave a hand in glad salute at the worthy as it loves to hurl a brick at the unworthy or mistaken. Bill MacCracken functioned with efficiency at a moment which was critical in the affairs of those interested in the merchandising of aeronautical material not only in our own great country but in the countries to the south of us.

The Pan-American Conference and the United States Chamber of Commerce convention will synchronize in Washington during the first week in May.

Some of the principal manufacturers of aircraft had known of this coincidence at least two months, but they needed Secretary MacCracken's call before they saw in it an opportunity to show their wares not only to the delegates from Latin America but to the more than 2,000 highly intelligent and enterprising men, all of selected mental stock, who will represent at Washington the chambers of commerce of the United States.

That such a gathering must be a vast commercial opportunity is obvious. It will give the aircraft manufacturers of the United States a chance to show their products to possible customers already here upon another errand and this is better than to send salesmen to the foreign countries or throughout the land.

MacCracken, as the man in charge of air for the Department of Commerce, thus far has shown that he is on the job. He will coöperate intelligently with the manufacturers. Now let them coöperate intelligently with him.

He called them in preliminary conference on March 7th and in his usual businesslike and forceful way fathered a resolution asking the Aeronautical Chamber of Commerce to recommend through its Flying and Show Committee the scope and plan of "an exhibition which shall assume proportions commensurate with the importance of the event."

The feeling of AERO DIGEST is a deep and gnawing yearning for a few more men like "Bill" MacCracken down in the Government offices at Washington—down there in Washington and in the industry.

His plans have worked out perfectly, as the plans of such men usually do. The work outlined at this meeting has been organized and a scheme developed which bids fair to turn a very profitable trick.

AERO DIGEST is all for men like this MacCracken person. They will fill the air above this man's country with the signs of progress, winged and buzzing with gas-motors, if they are properly encouraged. But what is to be said about the laxity of the industry's representatives who waited for MacCracken to point out the way by means of which they could make profit and do business?

One of these very men who was in attendance at MacCracken's meeting said the coming show would be worth $50,000 to each participating manufacturer because it would sell the principle of aviation to the members of the unusual delegations which will be gathered there in Washington simultaneously with the show.

The Aeronautical Chamber of Commerce is now hot for it all, as well it should be. The show is called for the four days May 2nd to 5th, inclusive.

These are not the times when anybody connected with aviation in America can afford to miss even the smallest opportunity. If the American manufacturers remember this, the people of America will pin their faith upon the breasts of those same manufacturers—and that is better than the finest medal in the world. The foreign aviation salesmen are neglecting nothing. The coming show will mean much not only to the manufacturers' pocketbooks but to the safety and prosperity of the country.

THE "Good Will Flight" of the U. S. Army flyers, despite its grim mishap, was an astonishing and splendid thing. But there is a mighty difference between the men who fly our Army planes and the bureaucrats who whirl our Army swivel chairs.

The performance of our Goodwill flyers should make the Department sitters regard with some slight interest the circumstance that an air mail and passenger service already is and for five years has been operating with success in Columbia, and now seeks to extend its service all the way to Colon.

Colon is one of the termini of the Panama Canal—and this company is German!

Germany, it will be recollected by those of retentive memories, is a European nation that not so long ago was canned with the assistance of the expert-canners of this country. This process became necessary because that kaiser and his countrymen, being fully established in one part of Europe, wished forcibly to seize that portion of it that they did not rightfully possess.

It would occur to AERO DIGEST that, this being so, America might pause in thought over this proposal of the Heinies to control an airline of which one end would literally be at the business end of our Canal—that wonderful Canal which we regard as our very greatest safeguard against defeat in that Pacific Ocean warfare which we all hope will not come but which we more than half expect. If Teddy, who built that great canal, were here today, there would be no nonsense of this sort in prospect.

Preliminary negotiations for a landing place at France Field, Colon, or at some other place upon the Isthmus, already are under way.

Here, it would seem to AERO DIGEST, is an emergency which calls for the enunciation of a Monroe Doctrine of the Air.

Translated out of its combination German-Spanish name the company is called "the Columbian-German Society of Air Navigation." We should sit more comfortably in our easy chair up in New York if any Isthmian air transport company might have "American" not "German" in its official name.

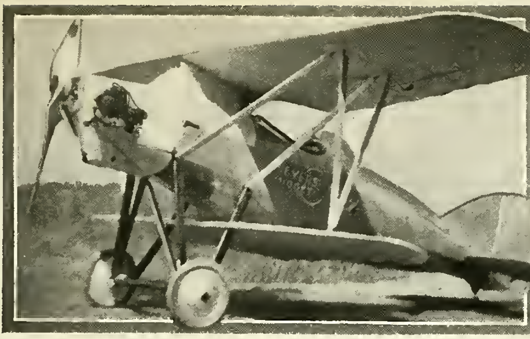
And if Germans can make a line of this sort pay why can't Americans? Virtually all commercial travelers visiting the Columbian interior now fly from the coast to the inland towns in this German company's German seaplanes, thus saving time and money. American planes would be much more appropriate for American Isthmian travelers.

Peter Paul von Bauer, an Austrian, is general manager of the Scadta and it is

(*Continued on page 348*)

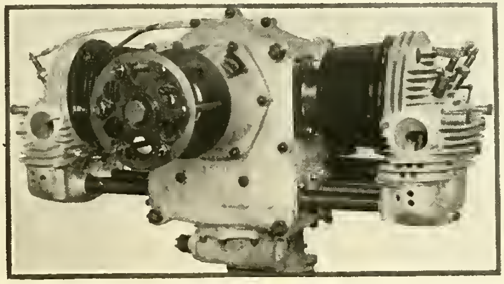
THE MEYERS MIDGET LIGHT PLANE

by
George F. McLaughlin



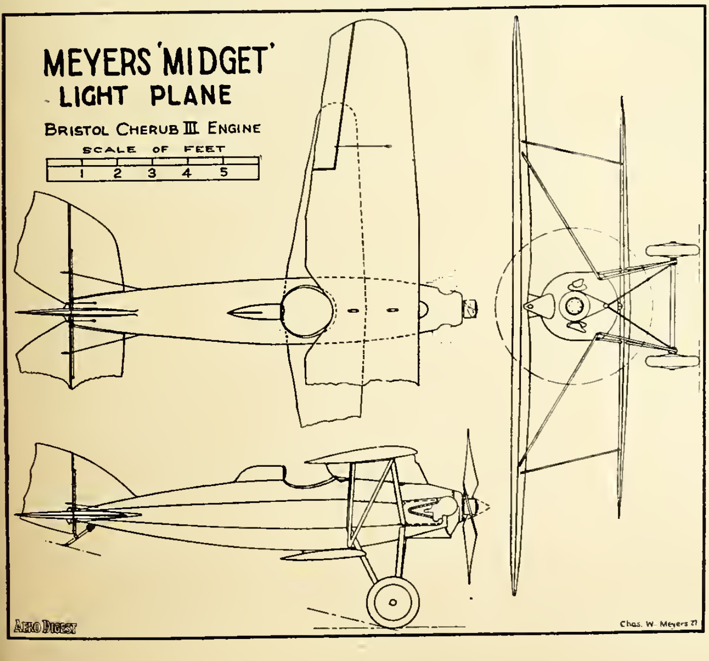
C. W. Meyers.

THE outline drawing published below was prepared by Charles W. Meyers, designer, builder and pilot of the Meyers "Midget" light plane in response to numerous requests for additional data on this interesting plane. Designed primarily for participation in the light plane contests at the National Air Races last September, the Midget was first flown at the Model Farms field, Philadelphia, just before the races. Very little time was left for testing the plane and as a result the machine was given its first real tryout during the race. Trouble with the engine developed while Meyers was flying low over a rough stretch of ground outside the air field and a forced landing was necessary. Meyers brought the machine down in a section covered with tree stumps and bushes, damaging the wing but not harming himself in any way. The fine flying qualities of the little ship were clearly shown before the mishap and no structural nor aerodynamical failures were responsible for its elimination from the race.



The 30-35 h.p. Bristol Cherub Series III engine.

Light plane builders will be interested in the clean lines which characterize this plane as well as the data on weights, and areas presented here for the first time.



During the race it was necessary for the plane to carry a load of sand weighing 54 pounds in order to meet the requirement of the race that a weight of 179 pounds was to represent the pilot's weight; Meyers weighs 125 lbs.

The Bristol Cherub engine used is the latest type (Series III) produced by the Bristol Company in England. The Cherub engine of 1924 proved itself a reliable light power plant but greater power was desired. The latest development of this engine therefore has a larger capacity and incorporates several refinements and improvements. The main change incorporated in the Series III Cherub is an increase in the bore of 5 m/m., the stroke remaining unchanged. Duplex oil pumps, giving a dry sump system of lubrication, and dual ignition, provided by a double pole magneto firing two plugs in each cylinder are provided in the new engine. The normal output of the engine is increased from 22 to 30 b. h. p. as a result, without any increase in weight.

GENERAL DATA ON THE AIRPLANE

Wing span, upper	16 feet 8 inches
Wing span, lower	12 feet 0 inches
Wing chord, upper	38.25 to 23.5 inches
Wing chord, lower	27 to 12 inches
Wing area, upper (with ailerons)	45.5 sq. ft.
Wing area, lower	24.5 square feet
Total wing area	70 square feet
Wing loading	6.6 pounds per square foot
Incidence angle, both wings	3 degrees
Length over all	13 feet 2 inches
Propeller (Curtiss-Reed)	3 ft. 1 in. pitch
Propeller diameter	4 feet 6 inches
Fuselage, bare, without covering, engine, mounts, etc.	45 pounds
Landing gear without axle or wheels,	9 pounds
Rudder, covered	2.5 pounds
Fuselage, landing gear, propeller, motor tanks, cowling, stabilizer, elevators, rudder, fin	224 pounds
Upper wing, with ailerons and control cables	37 pounds
Lower wing, complete	12 pounds
Interplane and wing truss struts	12 pounds
Complete machine, empty	304 pounds
Total loaded, full tanks and 150 pound pilot	480 pounds
Power loading, per h.p.	15 pounds

AERO DIGEST

Published Monthly
THE AERONAUTICAL DIGEST PUBLISHING CORPORATION
220 WEST 42nd STREET
NEW YORK

Vol. 10 APRIL, 1927 No. 4

VALUABLE HELP GIVEN

THE development of every type of aeronautical engine which has occurred in this country since the war has benefited by the coöperation of the Bureau of Aeronautics. Moreover that Bureau has placed sufficient orders for successful new type engines to enable their makers to proceed still further with developments. If this policy had not been followed during the past six or seven years there would be no engines in this country to-day except Libertys and Hispanos, and no more knowledge of aircraft engine design or development than before or during the war.

The engine is the heart of the airplane and the advancement in airplane design has always been directly proportionate to the advancement of the type of engine available. To-day there are four or five engine companies in this country who are meeting with success in engine development and manufacture. It is even well recognized abroad that American aviation engines are equal to anything available in Europe.

If this is the case it must be recognized that the Bureau of Aeronautics has been entirely responsible for without its support our engine industry would not exist. It is generally understood that the encouragement given to the Pratt and Whitney Company from this source assisted in the development of their well known "Wasp" which has supplanted practically all other engines of similar type in recent installations.

THE NEW AIR MAIL CONTRACT

JUST as we go to press the New York-Chicago air mail contract has been awarded. It seems to have fallen into capable hands. Lack of experienced men for flying and management seemed to be the one danger likely to threaten seriously the efficiency of operation under private management, which has been decided on for this and other air mail routes. But it now appears that the lowest bidder for this contract has provided men as experienced as any in the world to handle it efficiently.

Controller General McCarl advised that the lowest bidder must be given the contract and this lowest bidder, apparently, is the North American Airways of Cleveland.

That organization evidently fully appreciates as much as the Government the difficulties which might confront an organization not equipped with experienced men. They provided against the possibilities of anything of that sort by making integral parts of the organization the cream of the men who have been flying the mail for the United States Government. Fourteen of these, including Superintendent Carl F. Egge, are ready to take up, under the new private contract, the identical operations which they have been carrying on for the Government for a considerable period. These men know the business.

James C. Jones, president of the organization, and Charles A. Levine, chairman of its board of directors, are to be congratulated on the success of their endeavor to insure for their enterprise the same degree of success which the air mail has enjoyed under Government auspices.

The Bellanca ship which they propose to use also has proved its worth. By the performances of this ship, Mr. Bellanca has proven himself to be one of our foremost aeronautical engineers.

Under this contract everything indicates that America will become the beneficiary of another notable advance in commercial air transport.

GIVE CREDIT WHERE IT IS DUE

WHEN we reflect upon the rather generous treatment of our Air Services by the 69th Congress —when we read about the large contracts awarded to the manufacturers—and when we think about the excellent work done by the Congressional Select Committee of inquiry into operations of the U. S. Air Services and realize that all this and more was the result of the activity originated by General Billy Mitchell and later stimulated by his crucifixion through court-martial—we realize how much we and in fact every one in the nation owes to that man.

Understanding this we find it difficult to comprehend the attitude of some of our self-anointed purveyors of aeronautical equipment who are using every underhanded method they collectively or individually can devise to take away from General Mitchell the credit and honor rightly due him.

These manufacturers were starving to death when Mitchell started. He, like Nathan Hale, evidently felt his chief regret to be that he had but one life to give for his country and tried to waken the people of our nation to its defenselessness and the almost inconceivable incompetence of those in high places. Without Mitchell none of the paying business they are getting now would have been possible.

They are so short-sighted that they might as well be eyeless like the other poor fish that swim in the Mammoth Cave's dark lakes.

They are little minds however and soon fade out of the picture of America's air effort which must and will be painted on a big canvas with bold strokes. The artist as he creates that picture will see and paint into it only definite forms, constructionists.

The reborn and prosperous industry itself will have no room for petty politicians—they would be sore spots—health eliminates sore spots. Such men bear no relationship to the great air pioneers who went bravely into new and hazardous industrial fields.

They were too dull of sight really to see the chance before them. Some remain to-day too dull of sight to understand what has occurred and will occur to them if they continue to be retrogressive, selfish, narrow-minded, unpatriotic and visionless. Their policies and politics do not help their business which is aviation. They help the telegraph and telephone companies, the railways and most of all the steel organizations that supply the material to build fifty-million dollar battleships that will be destroyed in a half hour by an airplane that will cost about $10,000.

When America wakes up to what it ought to have and find it is exactly what it has not got, it will comprehend the fact that the few things it really possesses are due to the fighting qualities of Mitchell, the patriot, the true-soldier and far-seeing air man.

Those who have been and still are fighting him will be revealed as traitors to themselves, their fellow men and their country. In war time traitors are placed before the firing squad—at sunrise.

A NOD AND A WINK

At Mr. Wilbur, the Navy, Casey Jones, and other natural phenomena

By

Cy Caldwell

A TIMES dispatch from Bagdad reports that a pigeon, released during the christening ceremony of an airliner on the Imperial Airways, flew into the cabin and refused to quit when the plane set out from Bagdad, begad! During a halt at Gaza it was driven away, but as the machine was taking the air again the pigeon flew into the cockpit beside the pilot and remained there for the rest of the journey, apparently preferring the plane to its own wings.

There you are, Mr. Wilbur, even the pigeons are using airplanes. When are you going to give the Navy what it needs, instead of cutting down what it was allowed by Congress.

And just while I've got you button-holed, Mr. Wilbur, I'll mention that the Spaniards have put armor on the horses they use in bull-fights. So the horses are now as safe from aerial bombs as your battleships are.

And furthermore, Mr. Wilbur—pardon me if I'm keeping you, but it's so seldom we meet that I hate to let you go—I want to say how much I loved those little bed-time stories you used to write a while back. Dear, dear! I couldn't go to sleep without them. And to think that you became Secretary of the Navy after writing those dear little yarns! Well, there's hope for me yet. Oh—please don't go—just a minute.

Listen Curtis—I *may* call you Curtis, mayn't I?—h'm, so sweet of you—well, say, I've been reading in the gnus-paper about the Turkish ladies and their veils—Ah, I thought that would catch you. Eh? Oh, no—dear me, no! I was never in a harem. No. I wanted to go in, but they wouldn't let me. Now, stop looking naughty, because there isn't anything naughty about what I'm going to tell you—I'll tell you one of those when we're alone some time.

But this is just about the veils. You knew, of course, that a campaign of persuasion had been undertaken by the Turkish Government for the abolition of veils? The men's fez was abolished by decree, but they decided to persuade the women—they were all married men in the government, apparently. Well, Curt, it didn't work. The women wouldn't discard their veils. No sir. They wouldn't come out from behind those veils of antiquity and superstition and stupidity. They are just like that bunch of ancient mariners who won't put aside their veils and come out and see the airplane. They're determined not to see, just as you boys are determined—What? You're not leaving me? You—you what! You don't like me? I'm a nasty fresh thing! The idea! And I was so nice to you, too!

THE Associated Press reports that Pope Pius is considering the possibility of utilizing airplanes in the conduct of the affairs of the Church, and that he has already discussed aviation with various Italian aeronautical experts with that end in view. Airplanes may be brought into the service of carrying missionaries to far-off places, or to bring the Cardinals to Rome in the event of the death of a Pope.

Probably there is no organization in the world more conservative than the Catholic Church, more averse to change, which fact adds to the enthusiasm of those who believe in aviation when they learn that Pope Pius is considering the use of aircraft.

Surely, if the Church itself is considering aviation, is it too much for us to hope that some day even the heads of the United States Navy will also consider the matter?

IN describing the war maneuvers to be staged by the War Department in May, the New York *Times* used this expressive heading: TO FIGHT MIMIC WAR WITH 100 AIRPLANES. So far as the air is concerned, that's the only sort of war we're equipped to fight.

YOU six devoted readers, if you renewed your stock of culture by reading this column last month, may possibly recall a mild and mellow crack I took at Casey Jones, one of the most interesting adornments of that simple rural community which glories in the name of Garden City, and boasts the presence of the Curtiss Company. You may recall my mentioning that I flew Casey from Kansas City to Indianapolis, and that all I got for it was a small drink of Scotch.

Well, Casey read the remark, sat right down at his typewriter, got his Speller out, and wrote me a letter. "Dear Cy: I was deeply hurt by the reflections that you cast upon my good name—particularly when you stated that I gave you only a small drink of Scotch, upon our arrival at Indianapolis. As I remember it, when I left the hotel to make my train connections the last of the quart was rapidly disappearing, though I am unable to remember whether you or I got the majority of it. Your apologies will be accepted. With best regards, Sincerely, Casey."

Now, if he can't remember—and he says, "I am unable to remember," mark you!—is there any reasonable doubt as to who got the majority of that quart?

As a matter of fact, I recall distinctly, or fairly distinctly, that I got the majority of it. I usually do. There, I fooled you six readers—you thought I was going to say that Casey got the majority of it, didn't you? Well, he didn't; I got it. I'm a man of very few principles, but one of them is—and I hold to it with commendable firmness—never to be a slow drinker. Early in life I made up my mind, not only to be right with the crowd when they were imbibing, but, if possible, to be a little in front of them. I don't want you to think that I toss a drink down, and reach for another one before the other thinkers are ready. Nothing so crude as that. My standard procedure, worked out after a life-time of study devoted whole-heartedly to the art, is to drink half of my drink and then remark, with an air of annoyance, "You put too much ginger ale in this tipple—you ruined it. Hand me that Scotch so I can repair this drink. Thanks!" Then I fill the glass up to the rim with Scotch, and join somewhat more animatedly in the general conversation. Later in the evening, of course, it is possible to reach out for the bottle without calling attention to the act by any remarks whatever. Then, too, when the sacred rites have been in progress for some time, it is possible to joggle the arm of the drink-pourer, when he reaches your glass, so that rather more of the precious fluid than he intended to decant is shot into your goblet with a merry and soul-stirring splash. So when I stated that Casey gave me a small drink of Scotch, I don't really think I have anything to apologize

(*Continued on page 345*)

SUPER-AVIATION

By Dr. Michael Watter

AMONG the different means of locomotion air transportation takes the leading place on account of its speed and the resulting comparative economy. The aim of aircraft designers must be to achieve still higher speeds and the goal must be limited, if it ever will, only by the resistance of human organism and not by mechanical difficulties. Just what are the speeds which may be limited by the weakness of man is not known at present and engineers need not deal with this phase of the problem. The purpose of this article is to acquaint the reader with the studies made regarding the possibilities of flying at what at present is considered extremely high altitudes—30,000 to 70,000 feet and higher.

The ideas here expressed are not from the imagination of irresponsible inventors, but are the cool, calculating reasonings of such leading aeronautical authorities as Crocco, Constanzi and Guidoni of Italy; E. Dorand, Rateau and Breguet of France and others. It is the hope that this article will encourage further study of this extremely important question.

The two main equations expressing the conditions of flight are:

$$W = Ky \times (d/do) \times V^2 \times A \quad \text{and} \quad (1)$$
$$HP = Kx \times (d/do) \times V^2 \times A \times V/375 \quad (2)$$

Where W is the weight of the airplane; HP is the horsepower required to fly; Ky and Kx are the lift and drag coefficients respectively; V is the speed of advance relative to the air; A the wing area and (d/do) is the ratio of the air density at altitudes to that at sea level, called the relative density.

With increase in altitude air density decreases quite rapidly, for instance, at 39,500 feet the relative density being only about one-quarter. From equations (1) and (2) it is apparent that should we keep the product $(d/do) \times V$ constant, the horsepower required would increase in linear proportion to the increase in speed. This means that at 39,500 feet the required power for a speed twice that of the speed at sea level should be only twice that of the original one instead of being 8 times, as is the case for flight at the same altitude. The advantage of high altitude with its rarified atmosphere looms before us in all its immense importance. To an engineer this problem is full of difficulties but the problem seems much easier than the one solved by Orville and Wilbur Wright.

As a still further encouragement in studies along this line I cite the work done by Col. Constanzi, who by methodical research proves that while at small angles of attack the lift very nearly follows the law of squares, this relationship does not hold for the drag, the power exponent for the speeds below the speed of sound being less than two.

Whether this is true for the speeds aimed at by super-aviation is questionable, because this phase of flying touches on and passes into the regions of ballistics. In fact Col. Crocco in his studies on super-aviation assumes that the laws of ballistics hold true in this case and expresses the lift and drag as follows:

$$W = L = KY \times (d/do) \times F(V) \times A \quad \text{and}$$
$$D = Kx \times (d/do) \times F(V) \times A$$

The main principle of super-aviation as seen by him becomes the ballistical relationship: $d/do \times F(V) = \text{Const.}$

From this assumption Col. Crocco calculates the speed of the future superplane at varied altitudes. The table below is reproduced from *Notiziario Tecnico No. 7*. The formula of Chapel was adopted here as the base of F (V) and the variation of relative density based on the formula of Laplace, as follows:

Assuming that power increases with increase in altitude.

Altitude in feet	$\frac{do}{d}$	Speed in MPH
0	1	224
37,800	4	448
64,000	11.25	671
84,400	41.60	895
98,600	72	1118
106,800	102.5	1342
112,500	133	1564
116,600	163	1788
120,000	194	2010
122,800	225	2237
124,150	285	2685
131,000	347	3150

The studies of Constanzi are based on tests well below the speed of sound and therefore further researches are necessary. An interesting study along this line is made by Messrs. Driggs, Hull and Dryden in NACA T.R. No. 207 "Aerodynamic characteristics of airfoils at high speed." From their experiments it would seem that the drag coefficient has a tendency to increase and lift coefficient to decrease with increase in speed. At small angles of attack, however, this change is slight and the lift coefficient is even increased. The question of whether the laws of ballistics are applicable to forms such as wing with longitudinal dimensions considerably larger than the transverse one (contrary to the type of artillery forms) must await further experiments along this line. There is a wide field ahead of us before we reach the speed of sound and we may concentrate our efforts to attain relatively normal speeds of 400 to 500 miles an hour.

In one of his articles Col. Constanzi calculates the high speed of an airplane basing it on the results of his tests. Two sets of figures are reported. One is based on the assumption that drag varies proportionally to the square of the speed; the second is that the power exponent is less than two and is variable with the change in the angle of attack. The tables below give the results of this calculation.

HP=constant; drag exponent variable and less than two

Altitude (feet)	0	13120	26240	39400	52500	65600	78800	85350
Speed (MPH)	298	341	403	484	590	746	957	1087

HP=constant; drag variable as square of speeds.

Altitude (feet)	0	13120	26240	39400	52500	65600	——	——
Speed (MPH)	261	298	341	426	478	546	——	——

In considering the problem of super-aviation I limit myself to the questions of possible increase in speed and means to achieve it. There are problems of dynamical behavior of the airplane and strength, conditions of operation which are left without consideration. It would seem however that this side of the problem does not present any unusual difficulties and present design, modified to meet the conditions, can be used in these superfast machines.

(Continued on page 352)

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PILOTS' PHYSICAL TESTS

By Arthur La Roe, M. D.

Captain, Medical Officers' Reserve Corps

This is the concluding installment of the article by Dr. La Roe on the physicial standards of the new air regulations of the Department of Commerce.

DOUBLE vision is spoken of as diplopia. It is of course very disturbing and makes for great confusion in vision. Nature will not permit the condition to continue. She has two ways out. Whenever possible, and as long as possible, she makes one muscle do extra duty to hold the eyes in correct relative positions. In time this may result in first over-development, then fatigue of this muscle, and the condition may become worse and worse if uncorrected by glasses. Whenever nature cannot keep this corrected, and is not aided by glasses, she does the next best: she selects the eye giving the better image, concentrates the mental effort on that one, and permits the other image to go unnoticed. Just as a large muscle will wither away if not used, so also with all tissues, and in a little time the vision in the unused eye becomes almost entirely lost. Many of us are using one eye exclusively without being conscious of the fact. This is relatively unimportant in ordinary life, but in a circumstance where judgment of distance is vital it takes on great import. Our chief method in gauging distance is with the stereoscopic use of the two eyes together. It is readily seen then how important this ocular balance is to the pilot, who each time a landing is made must judge accurately the distance of the ground. This doesn't mean that a man with only one eye cannot at all judge distance, but he uses much less effective means, as relative sizes in the appearance of objects the exact size of which he knows, clarity of vision, and the relation of the position of one object to that of another. As for instance, when the roof of a hangar appears to him above the horizon, knowing the height of that hangar, he knows he is at least nearer the ground than the roof of that hangar. Take away from him these other means, as in the test for depth perception, and he is helpless indeed. Thus a man with monocular vision would in general fare much worse than one of binocular vision in a forced landing in strange country where he was not familiar with sizes and positions of objects.

Section 12 touches on this muscle balance, describes the tests to be made, and disqualifies all classes if diplopia develops. This exception is made, that Private pilots may be qualified if diplopia develops only at the extreme limits of the visual field—the eyes rotated far from the straight ahead position. In addition two other requirements are made to apply only to Transport class. The one specifically tests the up and down balance and permits no more than one degree of hyperphoria—one eye seeing one degree higher than the other. Of course this means even though the lower rectus muscle pulls the high eye down so that it does see with the other eye. The other specifically tests the in and out balance and requires for this class the normal condition of the inner muscles at least twice as powerful as the outer. This is done even though there be single vision, for under certain circumstances as with extreme fatigue or overwhelming emotion nature suddenly loses the control she has extablished by an extra effort on the part of one muscle. The expression "cross-eyed with fear" is seen to be therefore less of fiction than of truth. Imagine a pilot having strained his vision nearly to the breaking point with a vain search for a landmark in a fog, and then suddenly discovering a smoke-stack within a foot of his wing tip. Then imagine him to be of the psychologic type, to be touched upon later in this paper, upon whom the resulting emotion would have a profound effect with disturbance of heart action, blood pressure, and nerve control, and then when he does get a glimpse of something let the vision be the utter confusion of diplopia, two images of every object hopelessly jumbled, and I will permit you to draw your own conclusion of what the result will probably be. It may even help to justify the existence of a Flight Surgeon in those corners where his services are still considered worth about as much as a whip-socket in a flivver.

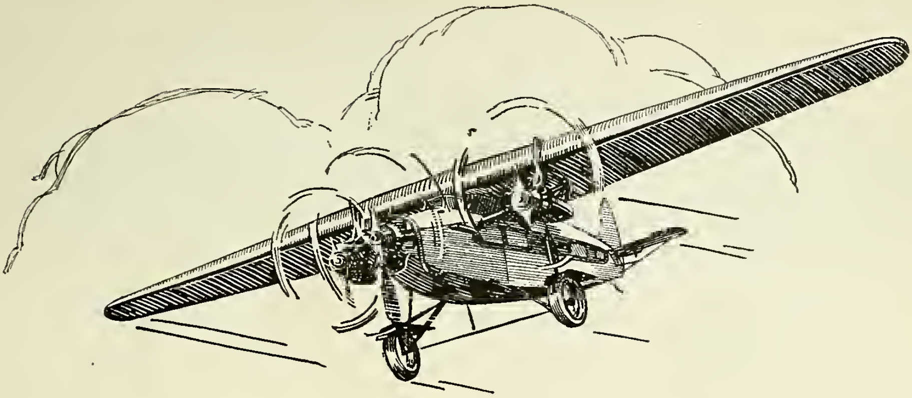
Section 13 covers some of the more gross conditions of the eyes such as trachoma or granular lids as it is commonly known, infectious diseases, scars from injuries which interfere with vision, and failure of the pupils to function with light and near vision—like an iris diaphragm in a camera. It disqualifies for any condition likely to disturb proper function under the fatigue and exposure of flying.

Section 14 prescribes a test for Transport class only, requiring a 20/20 vision under accommodation or close vision at 13 inches—reading small type, as when consulting the instrument board. It permits the use of correction in goggles used during the test.

Although the entire retina is sensitive to light, there is a tiny point in it called the macula which is especially sensitized. At this point the normal apparatus brings to a focus the image of the object seen. Normal vision requires however that the remainder of the field have a vision only less in acuteness as it departs from the macula. This is particularly important in flying, in order when concentrating vision on the course ahead to avoid danger approaching from some other angle. In Section 15 it is provided that the field of each eye be tested separately, with the vision fixed on a point in front, objects are brought in from the side and the angle noted at which they are first recognized. This in eight meridians. After this, colors are used and the points noted at which the colors are first correctly recognized. Normally an eye gets the form of an object furthest out, next inward it gets blue as a color, then red, then green. For this an apparatus called a perimeter is used. Any contraction of this visual field in either form or color disqualifies a Transport pilot; any marked contraction disqualifies either of the other two classes.

The foregoing is not to be confused with "color blindness." Some eyes are unable to respond to the different wave lengths of the vibrations of light which represent the different basic colors; cannot "tune in" in other words, or have "interference." Section 16 prescribes that any defect in central color vision, that is recognition of colors at the macula, will disqualify all three classes. The test is simple, selecting certain colors from a set of colored yarns or cards.

Section 17 examines the interior of the eyeball with an ophthalmoscope and disqualifies for one of several diseased conditions, some congenital, some acquired, and calls particular attention to a condition frequently associated with night blindness in which the retina on this examination is found to be unduly dark in color. This examination gives a hint at times of disorders in the kidneys, heart and vessels, and nerve system, and sometimes of systemic syphilis, which of course will be studied more in detail if indicated by the eye picture. (*Continued on page 352*)



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FLIGHT TRAINING—*THE STUDENT*

By Lieutenant Barrett Studley, U.S.N.

This is the second of a series of articles on Flight Training

WITH the recent vigorous expansion of commercial aviation in America, many different makes of new and modern airplanes are being placed on the market. The emphasis is now perhaps more on commercial than on private flying. But the man who could conveniently make use of personal air transportation, or who would like to fly purely for the sport of it, can now purchase a thoroughly reliable plane at a cost little more than that of a medium priced automobile. And there is every indication that in the near future quantity production will bring the price down within reach of the majority of car owners. Thus flight training is finally brought within the range of interest of the average man.

When the average man regards the idea of learning to fly, two questions will enter his head at once. "Is it difficult? Is it safe?" These questions are not to be answered with off-hand casualness. There is too much at stake. If considerable difficulty and danger are involved in flight training the prospective student is entitled to know it. If on the other hand flying may be learned without marked difficulty or hazard, a unique opportunity is offered to him. Consequently any answer must be maturely considered.

But, in the light of past experience, such an answer can be given. For the majority of active, alert and intelligent men, learning to fly presents no undue difficulty. And when training is properly organized it can be completed with a high degree of safety.

Four factors are involved in aviation training. They are (1) the student himself; (2) training conditions; (3) the course of training; (4) the instructor. The first of these is taken up in the present article.

For the prospective student the first question is physical qualification. The medical requirements for an interstate pilot's license are given in the Air Commerce Regulations of the Department of Commerce. They are the minimum necessary to insure safety in the air. It is imperative that a physical examination be made by a physician familiar with aviation requirements and that his report be satisfactory before training is undertaken.

The matter of psychological qualification is more difficult to determine. No more than a very approximate estimate of it can be made in advance. Only in actual training can it be definitely ascertained. But the more important factors in it can be given briefly.

The one fundamental psychological requirement is ability to develop the "feel of the air." The handling of an airplane in flight demands constant movements of three controls—elevators, rudder and ailerons. It would be a sheer impossibility to give individual attention to each movement of each control. The brain could never function with the necessary rapidity. And, moreover, with the entire attention occupied by mere maintenance of control, no useful purpose could be accomplished. Consequently control movements, instead of being guided by the conscious processes of reason, must be turned over to the comparatively effortless processes of instinct. Time and practice are requiréd to develop satisfactory flying sense. But when a student has reached the stage of progress where his movements of the controls are instinctively coördinated to produce smooth and effective flying, he has developed the feel of the air.

This natural or instinctive aptitude for flying varies in different students. Some learn very quickly while others take a longer time. A few men lack sufficient aptitude to enable them to solo safely. But the majority are able to meet this requirement.

There is no place where carefulness is more essential than in an airplane. A safety belt left unbuckled, a loose pyrene rolling around in the cockpit, a gas tank allowed to run dry, are all equally inexcusable. The careless man should never go near a flying field. Alertness is equally vital. Instruments, other planes, wind direction, a dozen different things must be watched constantly. Any tendency toward absent-mindedness must be left on the ground.

Coolness in emergency is indispensable to the competent pilot. The term emergency as used here does not indicate a situation in which danger is necessarily involved, but rather one in which particularly accurate handling of the plane is required to avoid damage to it. A forced landing for instance can never involve personal risk if adequate provision has been made for it and if the plane is properly handled. But it is not a situation where certain fundamental requirements can be forgotten with safety.

When it is decided to learn to fly, the question of training must be approached with a proper attitude. Flying is by no means as simple as driving an automobile. Training cannot be completed in a week's time. Constant and painstaking practice is necessary to develop any degree of proficiency, and that involves time and patience and effort. Progress is apt to seem slow. Mistakes are made with a recurrent regularity that may become discouraging. There are hundreds of things that a competent pilot needs to know, and experience must teach many of them. Flying is not a game for the man whose enthusiasm is transitory or whose persistence is spasmodic.

Nor can flying be half-learned with safety. An airplane must be flown properly or not at all. Habitual skidding on turns, an inclination toward "graveyard" glides or a predilection for leveling off at ten feet are sure indications of an approaching bargain for the junkman. There is only one correct way to execute any elementary maneuver, and that way must be learned thoroughly and adhered to rigidly. A pilot must fly his plane, not let it fly him. Aviation is safe, but only for the man who knows what it is all about.

Neither is aviation a get-rich-quick scheme. The man who enters it with the idea of picking up some easy money by sitting at the controls of an airplane is in line to be roughly disillusioned. Pilots are well paid, but they earn their money. Flying takes skill and precision that is not to be picked up for the asking. And it puts a responsibility on the pilot that he must be ready to undertake. His first obligation is to handle his plane effectively. What he gets for it comes second. Aviation does not want men whose attention is centered on a pay check.

This responsibility must be recognized by every student who expects to carry passengers or goods, in either commercial or private flying. The pilot of an airplane is in the position of the commanding officer of a vessel at sea. From the time he steps into the cockpit until he leaves it after flight he is responsible for its safety and for that of passengers or crew. All decisions must be made by him. He can secure neither advice nor assistance. On him rests the obliga-

(Continued on page 357)

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Synopses of Instruction and Advantages Offered in the Flying Schools of the United States

EMBRY-RIDDLE FLYING SCHOOL
Lunken Airport, Cincinnati, Ohio

A COMPLETE flying course is offered for $250, which includes 10 hours' dual and 1 hour solo flying. Or, instruction is given for $30 per hour up to and including 1 hour solo flying. After graduating students are rented ships at $15 per hour under the guidance of instructors. In addition, the course consists of aerodynamics, aerial navigation, motor overhaul and repair, meteorology, rigging, plane inspection and maintenance, air laws, rules and regulations.

School has been operating since November, 1925.

Living facilities for students may be secured on the field at approximately $10 per week, or facilities may be secured in the city at any price.

Five OX5 Wacos are used.

Number of students, eleven; number of instructors, two; number of pupils trained since starting, twenty-one.

Lunken Airport, a modern field in every respect, is at the junction of the Little Miami River with the Ohio, only five miles from the heart of Cincinnati, with bus and street car service near by. The field measures 4,200 x 3,800. The Embry-Riddle Company also operates a commercial and exhibition service.

MAMER SCHOOL OF FLYING
Spokane, Washington, and Spokane Airport, Parkwater, Washington

THE average cost of instruction is $200; $20 for additional flying time. The instruction consists of: Ten hours' dual instruction, mechanical and rigging course, primary flying, solo and all maneuvers in air.

The school has been operating two years.

Students live in city where board and room may be obtained for approximately $30 per month.

Two Swallow biplanes are used for instruction work.

There are at present twelve students and two instructors. Twenty-five pupils have trained since starting.

The field is located four miles from center of Spokane with trolley line connecting. It is about 700 acres in extent and is four way with level and gravel bed. As the field is under the supervision of the Washington National Guard Air Service, commercial planes may use field but ships must be housed off of field. The school hangars are therefore located adjacent to the field.

Lt. N. B. Mamer, who conducts the school, distributes planes and is senior pilot, Air Forest Patrol, District 1.

ROBERTSON AVIATION SCHOOL
Lambert-St. Louis Airport, Anglum, Mo.

AVERAGE cost of instruction is $300 for combined course or separate courses as follows: Primary, $400; Supplementary, $55; Intermediate, $100; Advanced, $150. Instruction by hour, $15 plus gasoline and oil, and $10 on student's own plane.

The course consists of: Dual instruction and solo, cross-country and acrobatics, overhaul, care and maintenance of plane and engine. Minimum time, 30 days.

The school has been in operation since 1919, when it was organized by the Robertson brothers; Major Wm. B. and Lt. Frank H., both graduates of Army Training Schools.

There are boarding houses and a hotel on the field at which room and board for students can be obtained at $10 a week. A Students' Barracks is being built, including sleeping quarters, mess hall, kitchen, recreation room and library. Restaurant on field.

Four ships of the following types are used: OX5-motored Standard Jls for primary training, Hisso Orioles and Liberty-motored DHs for advanced training.

Thirty students are enrolled so far this year; 88 in 1926; 76 in 1925. Four instructors are employed, with three air mail pilots available when needed.

The flying field is approximately six miles from St. Louis, and is easily accessible by railroad, street car and hard surfaced roads.

The Robertson Aircraft Company's factory and commercial service are located at the field and the planes of their air mail route from St. Louis-Chicago land there daily. Ten Army planes of the Missouri National Guard Army Air Service are also stationed at the field.

YACKEY FLYING SCHOOL
Checkerboard Flying Field, Forest Park, Ill.

THE average cost of instruction is $25 per hour. Instruction consists of dual, primary solo, advanced solo and cross-country flying.

School has been operating since 1919.

There are several large suburban towns within walking distance, and as a result fine living conditions are near at hand.

From eight to twenty ships are used: Canucks and Yackey Cruisers for beginners. The Yackey Monoplane, when completed, will be used for advanced training and solo flight.

From one to seven instructors are used depending on the demand. 76 students were trained in 1926.

Checkerboard Flying Field is located just N.E. of the Air Mail Field in Maywood, and has three runways—two of cinders and one of sod.

The cinder runways are in good condition and run N.E. and S.W. and N.W. and S.E. The field and school are operated in connection with the Yackey Aircraft Company's factory.

KREIDER-REISNER FLYING SCHOOL
Hagerstown, Maryland

ABOUT $165 is the average cost of instruction, which consists of: Dual instruction until student is able to fly solo with a reasonable degree of safety, but not making him competent to carry passengers for hire.

The school has been in operation two years.

The students may obtain lodging with private family at a cost of about $7 per week.

The number of ships varies from two to four. Canucks and Wacos are used.

At present there are five students and one instructor. During summer months two instructors are employed.

Twenty-nine students have been trained since starting.

Ships are kept in a very small field at Hagerstown, but they use either a large field in the neighborhood or the Government emergency landing field at Martinsburg, W. Va., which is about 20 miles distant. The Kreider-Reisner Aircraft Company also manufactures and distributes planes and equipment.

(*Continued on page* 290)

One of the classes of students of the Robertson Flying School with some of the mechanics and training planes.

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THE SWEENEY SYSTEM *of* *Practical Airplane Mechanics*

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opens up a world of opportunities for young men. The Sweeney System has no planes to sell, and sticks strictly to teaching both ground work and pilotage. Sweeney Airport is one of the best and safest fields in the U. S. All the resources of this **Million Dollar School** insure you the best, most practical instruction. Mechanics earn $50 to $150 a week. Flyers, up to $500.

The Sweeney System

is divided into two parts. **First:** You are thoroughly taught in the ground school. This fits you as an aviation mechanic. You can build your own plans and do anything required in aviation mechanics and construction and repairing when you have finished this work. You are thoroughly taught motors, etc., and work with thousands of dollars worth of new material, and all types of engines.

Secondly: After completing this work if you want to be a pilot you take ten hours of flying. Now when you understand that two to seven hours is all the average man needs to learn expert flying you will appreciate what ten hours in the air under skilled men will do for you.

On the ground 5 men are needed for one in the air, but if you want to become a pilot you easily master the work and can go into postal, government, or commercial work. Flyers are in demand, earning big money at fairs taking up passengers, etc. $5 for a 10 minute flight is pretty fine pay!

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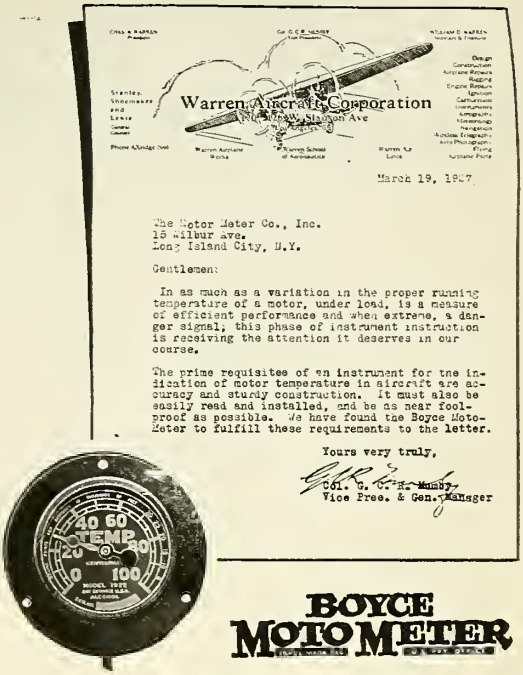
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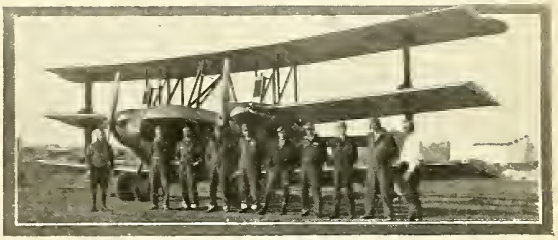

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WARREN SCHOOL OF AERONAUTICS
Los Angeles, California

IN addition to straight flying this school is teaching aero-engine work, airplane construction, instruments, aerial navgiation and meteorology. The cost of instruction is: Complete ground courses, $200; complete flying course, $250; combined course, $400; aero engine course, $100; airplane course $100; navigation and meteorology, $50. The course can be completed in three months. A life scholarship is given upon enrollment which entitles one to stay as long as one likes, or to complete the course and come back at any future date for additional instruction on any new equipment which comes out. Jobs are secured for students wishing to earn while they learn.

The school opened on January 10, 1927.

Living expenses are low in Los Angeles.

Five types of planes are used for training: Travel Air, Romair, Standard J1, Curtiss JN and Waco.

The location of the ground school is on Slauson Avenue within about 15 minutes of the business section of Los Angeles and a flying field has just been opened on Angeles Mesa Drive which is within the city limits of Los Angeles and may be reached by 5c car line.

About fifty thousand dollars worth of Ground School equipment is already installed or has already been shipped from various manufacturers for use in the school.

CHICAGO AERONAUTICAL SCHOOL
Chicago, Illinois; Milwaukee, Wisconsin

THE general course costs $350 which can paid for in cash for which there is a 10 per cent discount or in weekly payments. The home study course, consisting of thirty-two lessons including the subjects covered in the complete lecture course is $100, which is subject to a 20 per cent discount for cash. There is also a complete advanced course in aerial photography, the use and care of parachutes and stunt flying.

Instruction consists of a course of thirty-two lessons on theory and practice, a part of which are covered by lectures in a class room and part of which are given at shop and field with actual experimental work on engines and planes. For flight instruction after completing the general course, the student is qualified for solo flying and after he has completed that training he is allowed to use one of the school planes, if he so desires, for further solo time at the rate of $12 per hour.

The Training Division has been in operation for eight months and has at the present time 222 students and 14 instructors.

A branch of this instruction work has been opened in Milwaukee.

Their 140-acre field is located a mile and a half outside the city limits of Chicago in a rural community which is very easily reached by a concrete highway, street car line and bus. There are many desirable places for board and room near the field available, ranging in price from $8 to $10 per week.

At present they are operating eight planes, chiefly Wacos.

The Chicago Aeronautical Service operates a commercial flying service also.

HARRIS-RANKIN FLYING SCHOOL
Portland, Oregon

THE average cost of 10 hours' instruction is $250. Instruction consists of: Cross-country, stunts, dead-stick landings, solo flying.

The school has been operating since 1920.

The field is right in the city where regular city living facilities are available.

Four ships are used: JN4Ds and Wacos.

The present class has sixteen students; four instructors; 127 students have been trained since starting.

The field is on the east bank of the Willamette River, just opposite Swan Island, which will be the new municipal airport for Portland, and two miles north of the Broadway Bridge. It is 600 feet wide and 3,000 feet long, the long way of the field being parallel with the river and laying NW and SE.

The Harris-Rankin Flying Service is also conducted at the field.

COPLAND-BRINTON FLYING SCHOOL
Brainard Field, Hartford, Connecticut

THE cost of complete course is $175. Instruction consists of ground course (lectures and practical work on ships and motors) and flying course of at least 10 hours, or longer. A plane is furnished for license tests.

The school has been operating from Brainard Field since 1922.

Good living facilities for students are available at Hartford.

Two ships are used at present: Oriole and Standard.

Number of students—nineteen; number of instructors—two; pupils trained since starting—twelve.

Brainard Field, Hartford Municipal Airport, consisting of about 100 acres, is fully developed for day and night flying.

The Copland-Brinton Air Service also operates a commercial service.

LUDINGTON FLYING SCHOOL
Philadelphia, Pennsylvania

THE course is divided into two parts: the first, covering the necessary instruction in engine and plane mechanics, rigging, meteorology, electricity and aerodynamics; and the second consisting of 10 full hours of flying instructions. This course prepares the student to qualify for Federal pilot license, which is now necessary for interstate flying. Price, $300.

The school has been in operation for three years.

No living facilities are on the field, but may be obtained nearby, in South Philadelphia.

Five ships are used: Waco 9s and special Canucks.

About twenty students are trained each year. One instructor.

The school is located at Philadelphia Municipal Flying Field, South Philadelphia.

In addition to the flying school the Ludington Philadelphia Flying Service also operates a flying service and distributes planes.

(*Continued on page 292*)

Instructors and pupils of the Harris-Rankin Flying School at Portland, Oregon.

Learn to Fly *right*

Three types of planes used

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¶ Your life depends on your school's flying equipment and the ability of the instructors.

¶ Your future and your reputation as a pilot depend on the actual knowledge and experience your school can give—not on what a clever "ad" or a "fast talker" promise you.

¶ Conservative schools with years of experience and a long list of successful graduates do not need to make false promises or absurd claims to draw students.

¶ Wise students shun the "fast talker" and INVESTIGATE!

We advise and urge students to give all schools of aviation an unbiased and thoro investigation before enrolling

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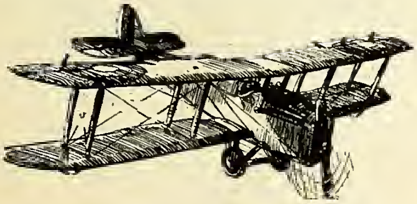

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OVERCASHIER AVIATION SCHOOL

Detroit, Michigan

TRAINING in practical aeronautics, airplane mechanics, design and piloting is given at the rate $25 per hour on a 10-hour course, including solo, if the student is qualified to do so. The courses can be taken in spare time, the students working and paying from their wages while learning. Motor, flying, design, airplane welding and construction courses are offered.

The school has been in operation since 1920.

Eight training ships are in service this year: Canucks, a high-lift Jenny, a high-lift JN6h and Air Kings.

One hundred students have been trained—20 last year and 10 are enrolled this year. From three to five instructors are employed.

Because of the difficulty of establishing permanent fields within the city of Detroit, the company coöperates with the leading real estate concerns, establishing temporary fields on subdivisions, putting in runways where needed. Five fields in the city limits are prepared for spring. The school is under State supervision, the planes and pilots are licensed by Detroit Police Dept., and are being licensed under Federal supervision.

The Overcashier Aviation Company, operators of the school, also constructs and builds planes and runs a commercial flying service.

STOW TRAINING SCHOOL

Stow Aviation Field, Cuyahoga Falls, Ohio

THE average cost of instruction is $275 for the complete course including 10 hours actual flying, elementary instruction in assembly, motor and plane construction, proper methods of inspection and traffic rules.

The school has been operating for eight years.

Living accommodations for students are good.

Seven ships are used: Standards, Jennies, Thomas Morse and Oriole.

About 20 students per year take the course. Two instructors are provided. 75 students have completed course since the school started.

Stow aviation field is located six miles northeast of Akron. Two miles east of Silver Lake on main brick road and car line going to Akron. Cuyahoga River and B. & O. R. R., two miles to the south of field. Latitude 41 deg. 10 min.; longitude 81 deg. 25 min.; altitude above sea level 1,140 ft.; magnetic declination 3 deg. West. It comprises 100 acres and has good clearance in all directions.

The company operates a commercial flying service from the field.

MEMPHIS AIR PORT FLYING SCHOOL

Memphis, Tennessee

THE course consists of: Airwork—turns, figure eights, straight flying, landings and takeoffs, acrobatics; all ground work connected with the theory of flight and motors, rigging and so on. The price varies, but seldom runs over $200 for the entire course.

The school has been in operation since 1922.

Living facilities for students are numerous at Memphis; transportation to the field, furnished.

At the present time they are training fifteen students. Since 1922, 150 students have graduated. There are four Waco 9s, two Standard J1s and one Laird at the field. One instructor and three call pilots.

The new Memphis Municipal Airport, managed by the Memphis Air Port Company, is located just eight miles north of Memphis on the Illinois Central railroad track. It is bordered on one side by the railway and on the other by the state highway. There is a restaurant on the field and ample hangar space. Cotton dusting and other commercial flying is done by the company.

ROGERS' AIR LINES

Port Washington, L. I., New York; Miami, Florida, and Lake George, New York

NO regular school is operated but training has been carried on during the past seven years, the cost of which is $300. Instruction consists of: Theory of flight; study of commercial air regulations; engine construction, overhaul and maintenance; rigging and airplane construction and maintenance; flying instruction, dual control, solo flying with a guarantee for pupil to receive a pilot's license.

The company has been in operation seven years.

Hotel accommodation is always available.

Five ships are maintained: Curtiss Seagulls with C6 motors.

Two students are under training now; six instructors; fifteen students have been trained in all.

Fields and airports: Port Washington, L. I., N. Y.; Miami, Fla.; Lake George, N. Y.

Rogers' Air Lines, Inc., also conducts a commercial flying service.

MAYER FLYING SCHOOL

Bridgeville, Pennsylvania

THE cost of course is $250 and consists of shop work, map reading, navigation, flying instruction up to and including at least a dozen solo flights.

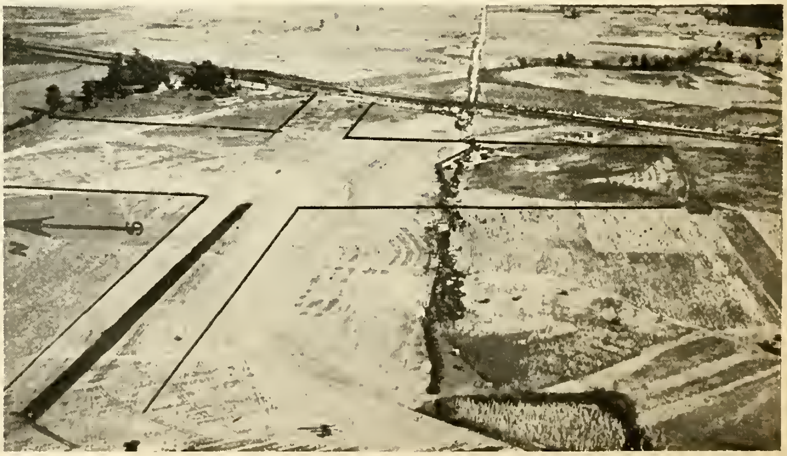
Six ships are used of the following types: Waco, Standard and Canuck.

There are six students at the present time and two instructors. Fourteen students have been trained since April, 1926.

The field is located on the Wm. Flynn Highway, ten miles southwest of Pittsburgh, and is an average western Pennsylvania field. It can be reached by rail, street car and automobile.

The Mayer Aircraft Corporation operates a commercial service also.

(The synopses of flying schools will be continued in the May issue of AERO DIGEST.*)*



The new Memphis municipal airport, home of the Memphis Air Port Flying School.

AIRPLANES

MOST all of the Standard J1 airplanes (numbering 452) were concentrated at Camp Logan, Houston, Texas. We were fortunate in purchasing half of these Standards and from time to time have shipped them up to our St. Louis warehouse in carload lots.

These airplanes were constructed during the war period. All were brand new in original crates, but we have taken them out of the crates and rebuilt the fuselages from nose to tail installing all new longerons, instrument boards, new seats, new landing gears, etc. We also reconstruct the wings and give them a thorough inspection and recover the entire ship with new fabric. We use six coats of freshly manufactured Nitrate dope, and the entire ship has the natural color finish. The aluminum cowls are painted a light blue, and this combination makes a very neat appearing ship. All of our airplanes are constructed in such a way that we guarantee them to pass the Government test. Each airplane is carefully inspected and given a severe test flight before we make delivery.

We invite you to come to St. Louis and go through our shops. We feel sure you will agree with the rest of our customers who have gone through our shops that this is the only company in the country which is actually rebuilding Standard airplanes as they should be built.

We sold 83 of these Standards last year, and a large percentage of them were powered with the OX5 motor. All of the fuselages are reconditioned so as to accommodate two passengers in the front seat and a pilot in the rear. The Standard airplane with OX5 motor installed will carry one passenger in the front seat and a pilot in the rear; with the Curtiss OXX6 100 h. p. motor, the Hispano Suiza 150 h. p. motor or the Curtiss K-6 motor of 150 h. p. the ship will carry two passengers in the front seat and a pilot in the rear.

NEW STANDARD J1 AIRPLANES

without motor; fuselage and tail members uncovered	$650
completely covered, set up, but without motor	750
with Government overhauled OX5 motor installed, 2-place ship—(our best seller)	900
with absolutely new OX5 motor installed	1200
with brand new Curtiss OXX6 100 h.p. motor, 3-place	1300
with Government overhauled OXX6 100 h.p. motor 3-place	1200
with guaranteed overhauled Model A Hispano Suiza 150 h.p. motor, 3-place ship	1350
with guaranteed overhauled model I, 150 h.p. Hispano Suiza motor installed, 3-place	1500
with guaranteed overhauled Model E, 180 h.p. Hispano Suiza motor installed, 3-place	1500

We have a few used Standard J1 airplanes with motors at **$650** ready to fly away in good airworthy condition.

NEW CURTISS ORIOLES

3-place, without motor	$1750
with Curtiss K-6 motor 150 h.p. installed, 3-place	2000
with practically new Hispano Suiza model E, 180 h.p. motor installed, 3-place	2000

DE HAVILLANDS

Completely reconditioned, wings and tail members recovered, less motor	$1000
with guaranteed overhauled Liberty motor	3000
with brand new Liberty motor	7500

THOMAS-MORSE AND SPAD SCOUTS

TM Scout, complete with new 80 h.p. Le-Rhone motor installed	$650
TM, Complete with 0X5 motor	1000
Spad scout, (which we consider much better than the TM, or TM Scout, as it has better performance, and is constructed much better) less motor	200

These Spad airplanes are fast single seater scout planes. They are in good condition but need recovering. Some of the wings need minor repairs. To close these out we are selling them at what they cost us. The motor mounting is for the 150 h.p. Hispano Suiza motor, but can be changed over to accommodate the OX5 motor planes crated f.o.b. cars at our warehouse at San Antonio, Texas.

CURTISS JN AIRPLANES

Reconditioned JN4D, with guaranteed overhauled OX5 motor	$750
without motor	500
with Hispano Suiza motor installed	1250
Reconditioned and recovered Canuck, with guaranteed overhauled OX5 motor	900
with brand new OX5 motor installed	1200
Special built Canuck with all lower wings finished in pigmented aluminum, blue cowls, that flew about 20 hours, a bargain at	1000

Write for free catalogue of our Flying School

ROBERTSON AIRCRAFT CORPORATION

OPERATORS OF UNITED STATES AIR MAIL ST. LOUIS - CHICAGO
LAMBERT-ST. LOUIS FLYING FIELD, ANGLUM, MO.

TECHNICAL DEPARTMENT

NEW HAMILTON ALL-METAL CABIN PLANE

THE Hamilton Metalplane Company of Milwaukee, Wisconsin, has just completed a very interesting combination cabin and mail plane of all metal construction throughout. A very commodious cabin seats four passengers in comfort. A novel feature of this metal plane is the arrangement of the cabin windows which are in the wing stub instead of on the side of the fuselage. This arrangement affords the passengers a splendid view of the country over which they are passing. An arm rest is provided at the point where the windows meet the fuselage giving the passenger an elbow roominess not found in the usual type of cabin construction. The wing stub is built in the upper portion of the fuselage so that the cabin is eight feet wide above the seats, which are arranged in the usual automobile coach fashion.

As a minimum amount of the fuselage cross section projects below the wing the resistance of the cabin is reduced to a minimum. Access to the cabin is through a door in the left side of the fuselage and one of the wing windows folding up. The passengers can converse with the pilot and also see most of the instruments. A view may be obtained through the streamline enclosure over the pilot's compartment. This also is provided with an extra exit. In the rear of the passenger cabin is a mail and baggage compartment of 70 cubic feet. Fuselage is eliptical in cross section which not only reduces the resistance but also makes this plane very maneuverable.

The empennage is metal covered and braced with steel tubing in diamond fashion. The stabilizer is adjustable in flight and the elevator control horn is concealed inside of the vertical fin which is adjustable. Control wires are carried inside the fuselage with the exception of a few feet leading to the rudder and ailerons.

The wings are full cantilever and they taper in plan and elevation. A modified NACA high lift wing section is used. There are three wing beams any one of which is capable of supporting the plane in full flight. The wings are each attached to the fuselage with six large chrome vanadium bolts, having a factor of safety of over twenty. Two forty-gallon gasoline tanks are located in the wings providing gravity feed to the motor.

The running gear is the usual split axle type with the compression strut running to the wing stub. The rubber shock absorber is in compression. The wheels are 32 in. x 6 in. fitted with Goodyear tires and Sauzedde brakes. The tread of nine feet facilitates landing in rough fields and ground maneuvering.

The power plant consists of a 200 h.p. Whirlwind engine mounted on a built-up metal engine mount of rigid construction. Eclipse inertia starter and Pioneer instruments provide the power plant equipment together with Hamilton propeller.

It is intended to make thorough tests of various designs of Hamilton wood and metal propellers, in order to determine the most suitable for all around commercial use. The pilot's cockpit is fitted for dual control with conventional stick and foot pedals. The spark and throttle controls are accessible to either pilot. The cockpit is completely enclosed but the side windows may be open or the top folded back in case of extremely bad weather.

This plane has a span of 48 feet 5 inches, an overall length of 31 feet 5 inches and a height of 8 feet 3 inches. The weight of the plane empty is 1856 pounds. The wings can be removed in twenty minutes and the whole plane can be stored in a space twelve feet wide and 32 feet long. The design of this plane is the result of three years of experimental research with metal construction. It is particularly suited for air mail feeder lines and taxi work where a sturdy construction and low maintenance cost are important factors.

FAIRCHILD-CAMINEZ DESIGN CONTEST

AS a practical incentive to the senior and post-graduate students of the Daniel Guggenheim School of Aeronautics, the Fairchild-Caminez Engine Corporation has posted three prizes for the best design of a training plane.

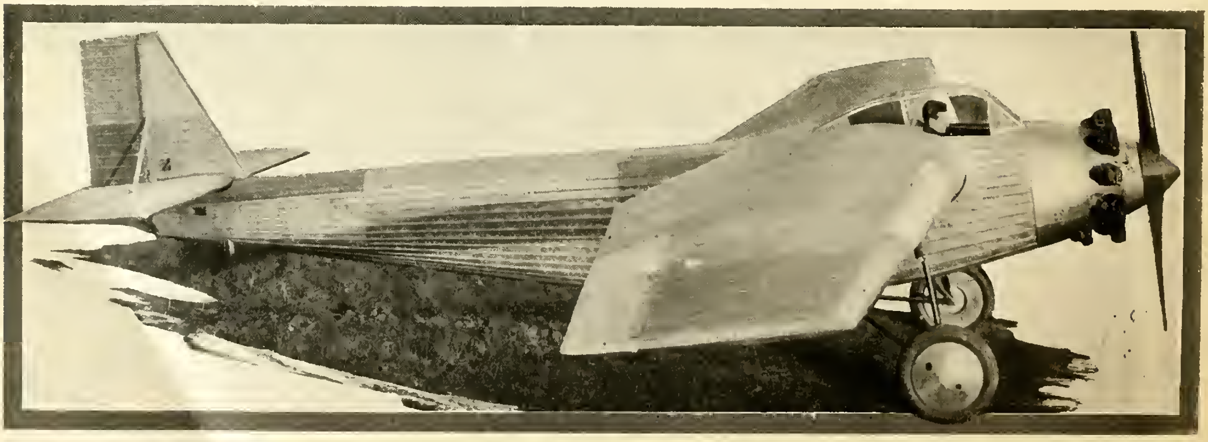
This is the first time that cash prizes have been offered to students, and it will undoubtedly be the forerunner of other prizes as it gives the students an opportunity to prove in practice their knowledge gained in the college work.

The Fairchild-Caminez Engine Corporation reserves for itself no right whatsoever, either in the winning or other designs. The successful student is free to sell or dispose of his design in any way he sees fit. The object of the competition is to bring before the aviation public the several designs which will demonstrate the unusual performance which may be expected from a modern air-cooled engine, such as the Fairchild-Caminez engine, in contrast to the war surplus engines now used in many low-priced planes.

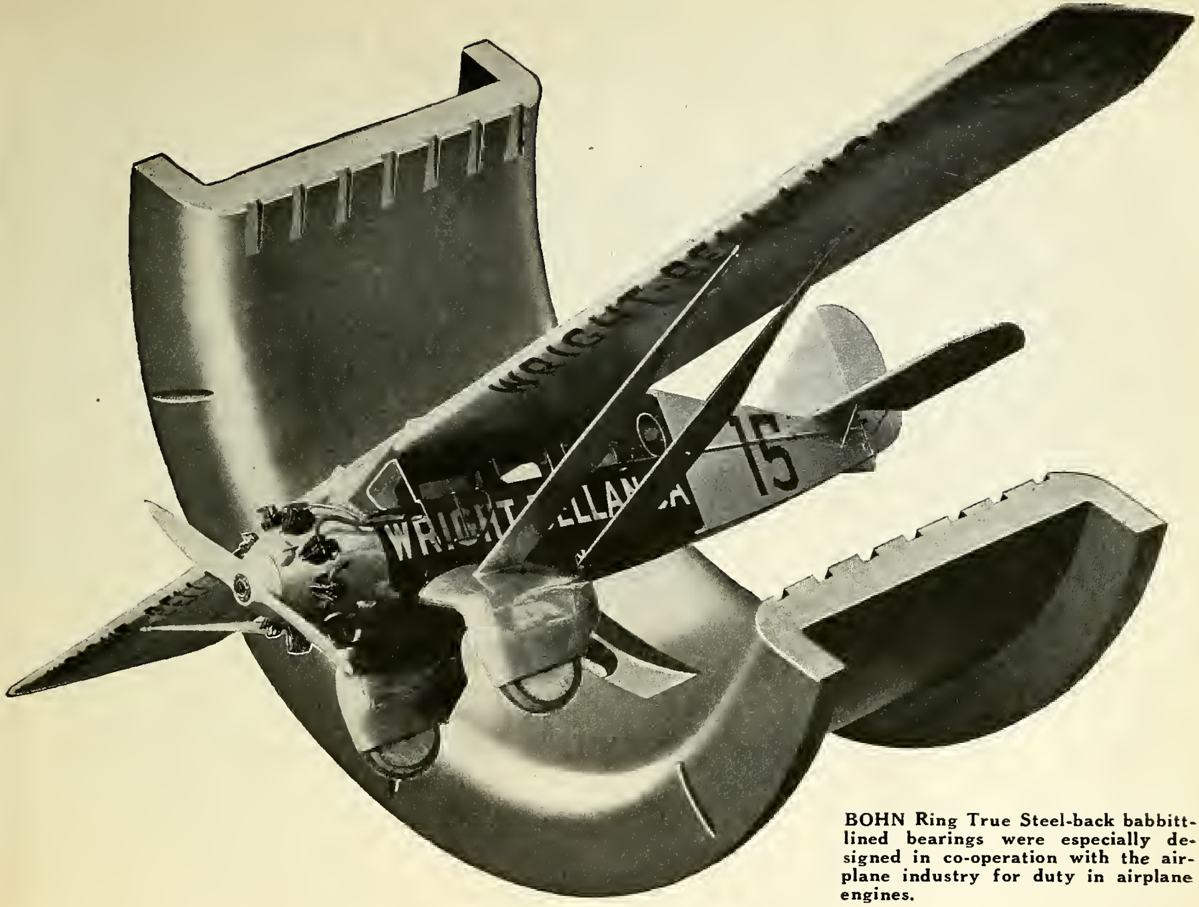
In offering this prize, the Fairchild-Caminez Engine Corporation has had the enthusiastic support of the Government bodies. Major General Patrick has appointed Major Leslie MacDill, Chief Engineer of McCook Field, to act as one of the judges, and Admiral Moffatt has designated Captain J. O. Richardson of the U. S. Navy, to act as the other judge.

The contest is open to all students of the Daniel Guggenheim School of Aeronautics. Drawings with calculations must be submitted to Professor Alexander Klemin on or before May 15th, 1927.

The winners will be announced about June 15th, 1927, and will be awarded $300 in cash prizes: first prize, $150; second prize, $100; third prize, $50.



The Hamilton all-metal mail and passenger monoplane seats four persons in its cabin.



BOHN Ring True Steel-back babbitt-lined bearings were especially designed in co-operation with the airplane industry for duty in airplane engines.

BOHN RING TRUE BEARINGS

are Standard

Besides supplying BOHN Ring True Bearings to most of the automobile manufacturers in the country—Ring True Bearings are standard in most every airplane you see.

BOHN Products include Ring True Bearings, BOHNALITE castings (both permanent mold and sand) and NELSON BOHNALITE Pistons.

BOHN ALUMINUM & BRASS CORPORATION

EAST GRAND BOULEVARD. DETROIT

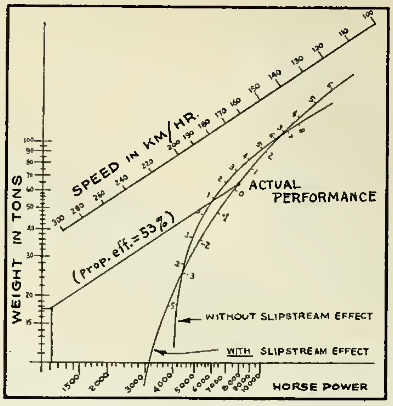
RICHARD-PENHOET FLYING BOAT

THE wide interest attracted by recent attempts to cross the Atlantic Ocean has centered the interest of the general public on planes capable of such a flight. One of the modern planes which its designer claims is capable of this feat is the Richard-Penhoet five-motored giant French flying boat. Points of interest are given here from the detailed description of this airplane published by the designer, Mr. Richard, in the *Bulletin de la Chambre Syndicale des Industries Aeronautiques.*

The R-P flying boat is a cantilever monoplane with a central hull, powered with aircooled Jupiter engines. Two wing floats of 318 cubic feet displacement assure the transversal stability of the plane on water.

Wing: The wing is constituted of a rectangular center section of constant profile with a span of 44.4 ft. and two trapezoidal outer portions tapered in thickness. The wing chord varies from 29.6 to 16.42 ft. The dihedral is 5½ degrees. The airfoil used is a modification of Eiffel 391, of varying thickness, decreasing from 20 to 12 per cent of the wing chord. The wing structure is composed of four wing beams and ribs. Beams are of special patented design; they are similar to the Vierendeel truss in which flanges are made of strips of spruce reinforced with a steel wire. The two flanges are joined by struts made of ash, glued and nailed by means of birch plywood gussets to the flanges, thus forming what might be called an open "picture frame" truss. The 29 main wing ribs are Warren trusses made of high grade steel and solidly connected to the wing beams. Drag trusses are two groups of Warren trusses of high grade steel tubing.

The wing profile is obtained by means of wooden ribs with spruce cap-strips and plywood webs attached to the beams. The leading edge is covered with plywood. The wings are fabric covered with the exception of the part adjoining the motors where the covering is made of corrugated duralumin.



Logarithmic polar diagram showing the performance of the Richard-Penhoet.

Ailerons are covered with plywood forming a solid box construction.

Hull: The total length of the hull is 85.3 ft.; beam 12.5 ft.; height 13.15 ft. There is a single step, 2.4 ft. back of a vertical line passing through the center of gravity of the airplane. It has a double bottom and is subdivided into 8 compartments separated by means of water-tight bulkheads covered with rubberized fabric. It has simple lines, designed with the double object of obtaining good water performance and aerodynamical fineness. It trims at plus 3 degrees so as to assure an easy and rapid take off. The hull is made of three layers of spruce, mahogany and teakwood of varying thickness from 6 mm. at the bow to 15 mm. at the step. At the stern the hull is made of plywood 3 mm. thick. The water tightness of the bottom is assured by special fabric lining. There are 15 longitudinal ash stringers supported by a transverse bulkhead formed of laminated ash. The trusses of the bulkheads are also the struts of the 4 principal longitudinal trusses running throughout the hull. These continuous trusses are of mixed construction. The lower girders and bottom keel angles are of wood. The upper part is Warren truss made of high grade steel. In the rear portion these 4 trusses converge into a steel stern post, the continuation of which forms the truss of attachment of the vertical fin and rudder. In front the upper girders form a similar construction to which is attached the mounting of the central motor. The upper deck of the hull, below the central propeller, is reinforced with a strip of aluminum. To this portion is attached a towing cleat and the bow chock.

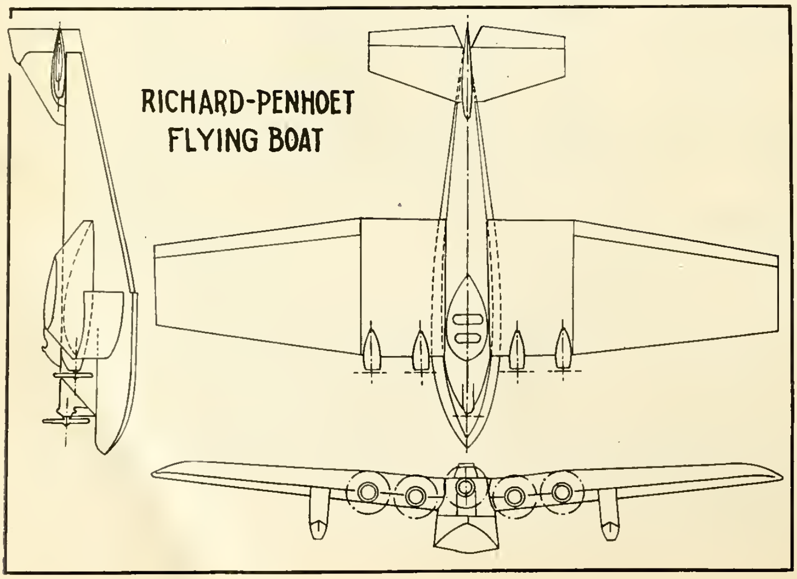
Wing Floats: Wing floats are of construction similar to the hull. They have a total displacement of 318 cu. ft. and are attached to the wing by bracing entirely enclosed in streamline cowling.

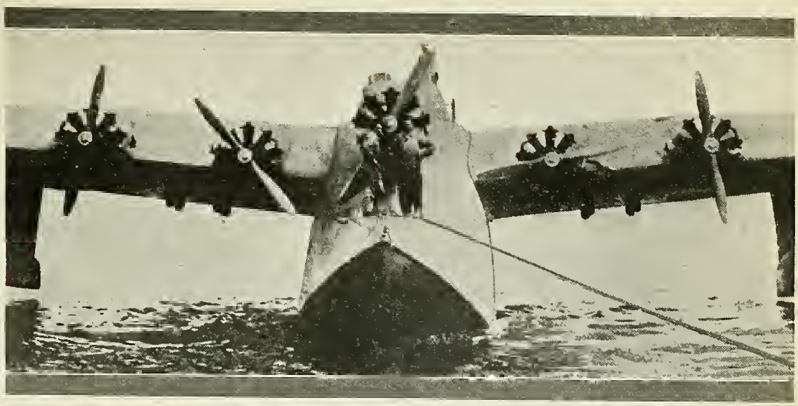
Stabilizing Surfaces: Horizontal stabilizing surfaces are of identical construction with the wing. The area of the stabilizer proper is 355 sq. ft. and the area of elevators is 118.5 sq. ft. Vertical surfaces are made entirely of metal and covered with fabric. The vertical fin area is 43 sq. ft. and the rudder area is 75.3 sq. ft.

Surface Controls: There are surface controls of two kinds; those for steering the plane and also the mechanism for adjustment of the surface during flight. The surface controls proper have a double action—they can be operated by hand or mechanically by means of a servo motor. A handle located at the pilot's seat enables a rapid change in the method of control without affecting the attitude of the surfaces. The vertical fin and stabilizer can be adjusted in flight to suit different conditions of balance.

Motor Group: The total motor power is equal to 2,100 h. p. The five propellers are two bladed tractor type, 9.85 ft. in diameter. The plane of rotation of the outboard propellers is 1.97 ft. from the leading edge of the plane. The motors are accessible in flight and for this purpose there is a special passage provided inside the wing with a height of about 2 ft. In the wing there are two groups of 4 fuel tanks of 525 liters capacity and containing fuel necessary for 7 hours of full power flight. Each tank is provided with a special dump valve mechanism for rapidly emptying, which minimizes the fire hazard. There are level gages on the pilot's and mechanic's instrument boards. The piping is arranged in such a way that either of the fuel tanks can feed any or all the motors. Compressed air is used for starting the engine. As a precaution there are pressure fire extinguishers installed near the engines.

Pilot's Cabin: Due to the great number and the diversity of the instruments, there are two places of command—one for the pilots and the second for the mechanics. The first one, placed well forward, assures perfect visibility. It has dual control easily accessible in flight. Instruments are placed in such a way that they are visible to both the pilot and mechanic. The compartment for the mechanic is situated in the wing at the height of the center motor. It has a regular installation which permits complete





Front view of the giant Richard-Penhoet Flying Boat which is being prepared for a flight across the Atlantic this year.

control of all the motors, ignition, switches, voltmeters, servo motor, starters and all instruments of control required in flying. This location is also advantageous because it permits easy access to all the parts of the boat requiring special attention. A door leads to the interior of the hull, which is two stories in height. The entrance room in the upper part has a stairway leading to the central cabin which is 34.5 ft. long, 11.5 wide and 6.56 ft. high. This cabin has accommodations for 20 passengers. In the bow there is a compartment for such equipment as, anchors, gaffs, etc. Behind this are the radio rooms. The power of the radio apparatus is sufficient to send out a message to a distance of 935 miles and the radio telephone transmits to a 500 mile radius. All the way in the back there is a rest room the cabin of the commander and spaces for baggage. There are 18 windows which can be opened for ventilation. The conditions of balance do not permit the use of the aft portion of the hull, but there is a passage leading to the stabilizing surfaces so that a complete inspection of the surface controls and adjustment mechanism is possible during flight. The following are the general specifications:

General Specifications

Wing span	131.2 feet
Length	85.8 feet
Height	21.4 feet
Power (five 420 h.p. engines)	2,100 h.p.
Gross flying weight	38,600 pounds
Weight empty	37,039 pounds
Useful load	11,551 pounds
Crew, merchandise and equipment, weight	7,591 pounds
Weight of fuel and oil for 7-hour flight	3,970 pounds
Wing chord, maximum	29.6 feet
Wing chord, minimum	16.42 feet
Maximum thickness of wing	5.91 feet
Wing area, total	2,905 square feet
Aileron area, total	420 square feet
Stabilizer area, total	355 square feet
Elevator area, total	118.5 square feet
Fin area	43 square feet
Rudder area	75.3 square feet
Weight per square foot	13.3 pound
Weight per horse power	18.4 pound

Performance: During the first trial flight the gross flying weight was 38,600 pounds, composed of the following items:

Wing

(Total, 11,878 pounds)

Beams	7,240 pounds
Main ribs, motor installations	2,330 pounds
Rib formers	710 pounds
Ailerons, controls, balanced part	661 pounds
Covering, dope, paint	1,037 pounds

Hull

(Total, 7,874 pounds)

Bulkheads	2,150 pounds
Upper girders of fuselage	1,070 pounds
Sides, bottom, bow	3,000 pounds
Cowlings, pilot's cabin, fabric, paint, finish	772 pounds
Floor, stringers, attachments	882 pounds

Surface Controls

(Total, 1,295 pounds)

Horizontal surface controls	1,015 pounds
Rudder	132 pounds
Fin	110.5 pounds
Controls	37.5 pounds

Motors

(Total, 5,415 pounds)

Five motors	4,190 pounds
Propellers	287 pounds
Starters, fire extinguishers, controls and auxiliaries	938 pounds

Fuel and Oil Systems

(Total, 574 pounds)

Total weight of plane empty..20,739 lbs.

Useful Load

(Total, 11,561 pounds)

Servo motor	441 pounds
Radio, batteries, etc.	1,210 pounds
Electrical installation	220 pounds
Anchors and auxiliaries	265 pounds
2 pilots, parachutes, etc.	441 pounds
1 mechanic	154 pounds
Fuel and oil	3,970 pounds
Extra load	4,860 pounds

Eight trial flights were made at a total duration of 6 hours. The machine proved to be easily controllable and perfectly air and seaworthy. The high speed attained was about 100 m. p. h. and the altitude reached in 30 minutes was 3,950 feet. We reproduce the logarithmic polar diagram of the Richard-Penhoet flying boat with and without the influence of propeller slipstream. Mr. Richard calls attention to the fact that calculated performance and balance were verified by actual flights and explains the low performance of the craft by poor "propulsive efficiency" which he explains as follows:

1. The proximity of the propellers to the leading edge of the wing and a consequent interference.

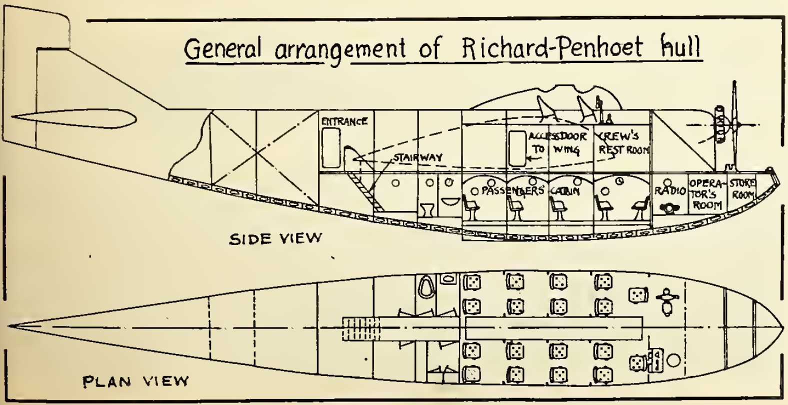
2. The small propeller diameter and a presence of non-cowled engine still more accentuate the main interference.

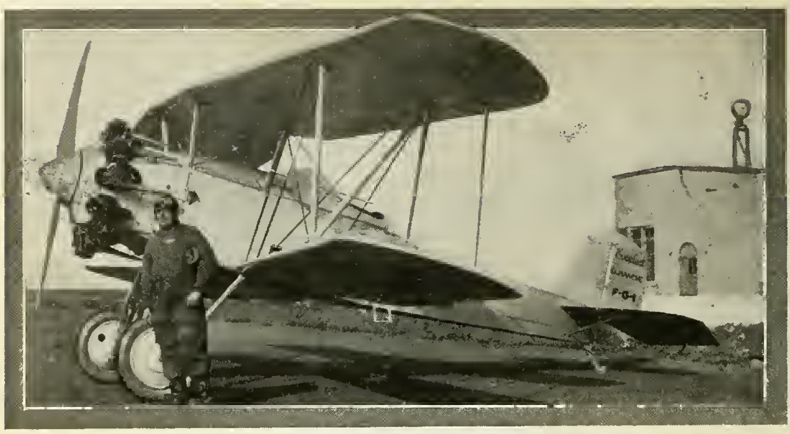
3. The high revolutions of the propellers (1720 r. p. m.) do not permit of good propeller efficiency in an airstream slowed down by all the named interferences.

To remedy all this the plane of propellers is being moved forward 6.5 feet in front of the leading edge of the wing, and the propeller diameter is being increased to 13.15 feet which will permit of the use of a geared down motor.

It would be interesting to know what advantages are claimed for the type of construction used in the wing beams. The Vierendeel truss, originated in Belgium, was primarily sought as an aesthetic form of a reinforced concrete bridge. It was abandoned later mainly because it is heavier than the ordinary truss, the secondary stresses being of primary importance in its design. The Vierendeel truss is $3n$ times statically indetermined, n being the number of bays. The uncertainties involved in designing a similar truss are usually met by a factor of safety higher than the one which would be used in an ordinary trussed or beam type of combination. It would seem that the complexities and uncertainties involved in the Vierendeel truss would indicate the undesirability of this type of structural form as adapted for use in aircraft.

General arrangement of Richard-Penhoet hull





The new Eberhart "Comanche" type F-G-1 Navy fighter.

EBERHART "COMANCHE"

THE "COMANCHE" F-G-1 airplane was designed by the Eberhart Aeroplane and Motor Company to specifications issued by the Bureau of Aeronautics of the Navy Department. A number of the important features of the airplane were incorporated from ideas and suggestions of the Bureau of Aeronautics, which are the results of more than two years study and research by the Navy Department.

The primary purpose for this type is for use aboard battleships as seaplanes to be catapulted from the decks of the ships. As a landplane it is suitable for use aboard aircraft carriers. Equipment is provided for deck landing aboard the carrier and for catapulting as a landplane. This type of airplane is required to be extremely fast and maneuverable, and at the same time have a low minimum speed for catapulting and deck landing.

The power plant consists of the Pratt and Whitney 420 h. p. aircooled engine. The fuel capacity is 80 gallons including 10 gallons reserve capacity. Fuel is delivered to the engine by an engine pump. An auxiliary hand pump is used in the lines. A pressure fire extinguishing system is used for controlling any fire which may originate around the magnetos or the carburetor.

The wing arrangement is very unconventional as the upper wing is swept back considerably while the lower wing is swept forward. This results in a heavy stagger at the fuselage with no stagger at the tips. This is done to improve the visibility for deck landing and fighting, as well as for various structural reasons. The visibility is excellent. The wheels can be seen from the seat in the normal position and by raising the seat a view of the ground or deck is obtained, which has never been secured on any other airplane.

The entire structure of the airplane is metal. The fuselage is welded alloy steel, the tail surfaces are a combination structure of steel and duralumin, and the wings are constructed entirely of duralumin with the exception of the fittings which are alloy steel. The wing beam is a special girder structure, the result of extensive development and tests. The floats are entirely of sheet duralumin construction.

Detail Specifications of the F-G-1

Overall span	28 feet 9 inches
Overall length	22 feet 2 inches
Area of wings (including ailerons)	242 square feet
Weight empty (landplane)	1,810 pounds
Normal useful load	755 pounds
Gross weight with useful load,	2,565 pounds

LENERT METAL PLANE

WHAT is hailed as the first "all-metal biplane" built in this country is at the present time being tested at the Municipal field at Chicago, Illinois. No reports have been given out as yet on the results of flight tests.

The Lenert all metal biplane is manufactured entirely of duralumin and steel with the exception of the wood prop—(metal if desired)—rubber tires and wood control stick. The general specifications are as follows:

Total weight	950 pounds
Wing span	25 feet
Length	24 feet
Wing area	255 square feet

One of the interesting features of the plane is the geared control on which patents are pending. Production is planned giving purchasers an option of either the regular aileron or the patented balanced control. The design is free from internal wire bracing. All struts and other strength members are either of steel tube or duralumin.

Flight test results will be given later.

NEW RUBBER PRODUCT

A SHORT time ago the B. F. Goodrich Rubber Company announced the discovery and development of Vulcalock—a cement-like mixture which causes rubber to stick to metal or wood. And now Goodrich research engineers are converting rubber into lumber.

This new product, which has been called Aeroboard, has been used experimentally in the construction of a few speed boats, pontoons and airplane fuselages. In all such tests it has shown excellent results. Reports indicate that the new material can be worked practically the same as wood and in many cases can be worked into difficult rounded or curved shapes much easier than wood. It can be attached to frames with nails or screws without danger of splitting.

Due to the softening characteristic of rubber when heated this material can be molded to difficult shapes when heated to the temperature of boiling water and retains such shape when it is cooled without destruction of any of the original tensile strength of the board.

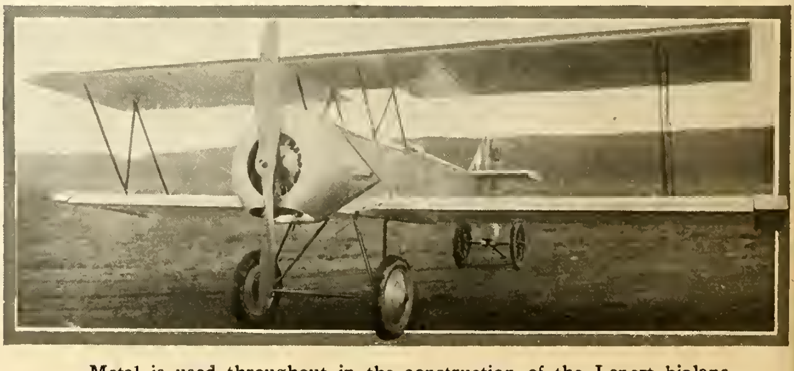
Rubber has a natural flexibility and the retention of much of this quality in Aeroboard, Goodrich engineers claim, will prove of incalculable benefit in fuselage construction. The stresses set up in an airplane fuselage when landing are more likely to be absorbed and their destructive strains checked or eliminated when the body is of rubber lumber.

Tests conducted showed that the rubber lumber withstood strains of great force. In practically all cases the resistance to breakage force was equal to wood of the same thickness and under some conditions the rubber lumber showed itself to be from two to five times stronger than wood.

It possesses a very low moisture absorption quality which naturally recommends the material for light boat construction. Laboratory experiments established the fact that the new material would absorb less than 1 per cent of moisture when immersed in water maintained at a temperature of 70 degrees F. for seven weeks.

Rubber naturally resists the corrosive action of sea water and barnacle growths do not attach themselves to it easily.

The new material is not being produced in commercial quantities at the present time, but the Goodrich Company is planning on such production at an early date.



Metal is used throughout in the construction of the Lenert biplane.

"Independence Complete Protection" for Aircraft
Another "Beacon of Safety"

"Independence Complete Protection" insures against all aircraft hazards and is another "Beacon of Safety" for Manufacturers, Owners, Operators, Pilots, Shippers and others in this rapidly growing and essential industry.

Seven coverages are obtainable in the Independence Companies "All-in-One" policy—other coverages in separate Independence policies.

THE INDEPENDENCE COMPANIES
Home Offices—PHILADELPHIA
CHARLES H. HOLLAND, President

Casualty Insurance · Surety Bonds
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These Companies maintain Human Relations with their Agents, Brokers and Policyholders

THE LATEST JUNKERS Type G-31

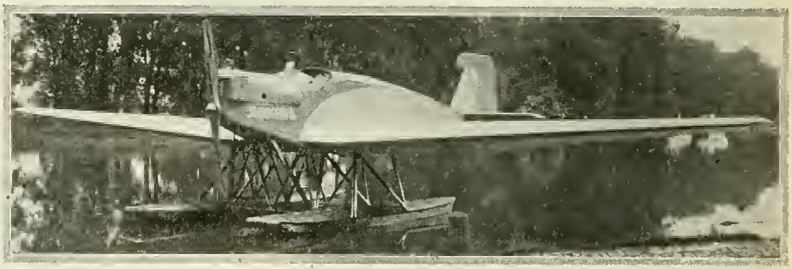
THE first Junkers commercial airplane made its appearance in 1919 and since that time the Junkers research organization has been at work trying to develop other types better fitted to the present requirements of commercial aircraft. The first three-engined Junkers aircraft, type G-24, was put into commercial service more than two years ago and during this time it has been extensively used in European air lines, as well as in South America and in Asia. The Berlin-Peking-Berlin Expedition which took place a few months ago was a fine demonstration of the qualities of the G-24.

However, the G-24 was only a steppingstone for further progress. The new type, G-31, represents the latest production of the Junkers organization. In the design and construction of this new type the knowledge and experience acquired in the research department, as well as that gained in the manufacturing and operating branches of the Junkers organization, have been applied.

This new type of airplane, which like all other Junkers machines is of the unbraced, cantilever type, all-metal duralumin construction, is fitted with three engines: one in the center and two on the wings, same as in the G-24. The total horsepower delivered by this power plant is 1,200 h.p. and the total weight of the machine, loaded, is 8½ tons. Fully loaded this machine has a cruising range of 700 miles and a cruising speed of 125 miles per hour. The span of the wings is 103 feet. The length of the plane is 55 feet and its height is 20 feet from the ground.

The cabin which is provided for the accommodation of the passengers is exceptionally spacious, being almost 7 feet wide. On account of the large dimensions of the cabin it has been possible to provide three freight compartments in this machine, in which can be stored all freight and luggage so that no grips need to be carried in the cabin.

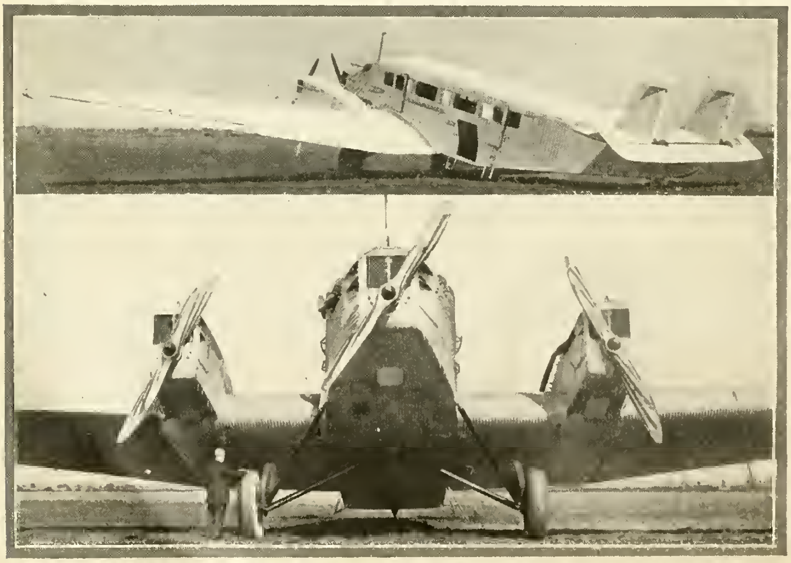
Underneath the passenger cabin, on each side of the control tunnel, are two baggage compartments where even the biggest wardrobe trunks can be safely stored. These compartments are electrically illuminated. In addition to the baggage compartments there is also a roomy freight compartment where heavy freight and mail can be stored. This compartment is also used for housing an auxiliary power plant consisting of a small-motor-driven 110-volt generator which supplies the electrical illumination when the machine is on the ground. The motor driving this generator also drives a compressor which provides compressed air for starting the engines on the ground. This electrical generating plant also supplies the electrical energy for the radio receiving and sending apparatus, in addition to the operation of landing and running lights.



The Junkers type J33 with a Junkers L5 engine and twin floats.

Of course, except when the machine is on the ground this electrical generating plant is driven by the air blast of the flight through a propeller provided for this purpose. Two additional propellers are also provided for driving two centrifugal pumps, either one of them being sufficient for feeding the three engines; this, in addition to a hand operated pump.

The longitudinal stability of this machine is rather remarkable. An adjustable stabilizer is used which allows the passengers to move about freely without disturbing the stability of the machine in flight. In the empennage the double rudders provided in this machine, will, in case that one of the engines should stop, still keep the plane under perfect control, only a slight pressure on the rudder pedals being needed for this purpose. Any slight unbalanced pressure on the rudders is easily compensated from the cockpit.



The triple-engined Junkers type G-31, passenger and freight air liner.

The tail-end of the fuselage is so roomy that there is a gangway leading to the extreme end of the tail, and the fuselage rear-end fairing which carries the stern light is fitted with two handles which allow this to be easily detached for inspection purposes.

The double cockpit in front of the machine offers the feature of being roomy and comfortable for the pilots to sit in, and all the instruments are conveniently arranged in front of them.

The propellers used on this machine are of the Junkers type of metal forged construction. Everything in this machine is made of metal and even the landing-wheels are cast of light metal. The only non-metal parts used in this plane are the pilots' seats and the tires, besides the cabin equipment.

The passenger cabin is divided into three intercommunicating compartments: the first has two beds of the same dimensions as are used for sleeping car berths, and two very comfortable club chairs; the second has four club chairs; the third has a sofa which seats two persons and a club chair. A door opening in this third compartment leads to the toilet.

Each compartment is provided with efficient ventilators, is heated by the circulation of warm air, and is brightly illuminated at night. Large windows on either side of the cabin provide an unobstructed view of the panorama for the passengers, and plenty of sunlight. These windows can be opened by means of a cranking device which allows the glass panes to slide longitudinally in their frames. In order to provide for the maximum comfort of the passengers the exhaust pipes of the engines are led all the way back, past the rear of the cabin, thus diminishing the noise of the engines.

Seating accommodation in this airplane is provided for eleven passengers, and four additional chairs can be placed in the interior of the cabin, thus providing very comfortable accommodation for fifteen passengers.

In designing the passenger cabin of this machine, the comfort of the passengers has been given first consideration, the idea being to give them plenty of room to move around and comfortable big chairs to sit in.

EXPLORERS TO FLY TO POLAR GOAL IN SAFETY AND COMFORT!

Wilkins Starts New Land Quest With Two

STINSON-DETROITERS

America's Finest Aircraft

These business men, too, are flying in rain, snow or gale without overcoats.

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President, Contractors Equipment Co.
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President, E. S. Evans Corp.
Austin F. Bement,
President, Austin F. Bement, Inc.

Backed by a powerful financial group and instructed to purchase the best planes for his purpose, Captain George H. Wilkins, Commander of the Detroit News-Wilkins Arctic Expedition, selected two Stinson-Detroiters.

Captain Wilkins knew that the Detroiter had proved its reliability in hard daily service on three commercial airlines and in the hands of private owners. He demanded quick take-off on both wheels and skis with gasoline for an 1,800 mile non-stop flight.

Stinson-Detroiters met every test. Carrying a useful load of 2,045 pounds they took-off in 450 feet, and when in the air, flew and climbed on 1,460 out of a maximum of 1,830 r.p.ms., proving conclusively that the unusually heavy load had not taxed the performance of the planes.

The Detroiter with enclosed sound-proof, heated cabin, starter, brakes and inherent stability, has set present day styles in airplane construction. It is the ideal plane for the airline, the business organization and the private owner.

These features, plus high performance, explain why the Detroiter is outselling all planes of its type.

For full particulars, write

The Stinson Aircraft Corporation

Detroit, Michigan

THE NEW FARMAN TYPE A2 RECONNAISSANCE

THE new Farman A2 is a single motor Sesqui-plane equipped with one Farman type WE 12 cylinder 500 h.p. engine. This engine is equipped with a reduction gear, the propeller turning one to two with the engine. The machine is of wood construction with the exception of the motor bed, which is entirely of metal. It accommodates a pilot and an observer, the latter placed directly behind the pilot, permitting easy and constant communication between the two. Dual control is provided.

The upper wing is built in one section, having a span of 48 feet. The wing construction consists of two main box longerons, to which are mounted the ribs, the whole being reinforced by steel cross wire. The small lower wing is of the same construction as the upper wing.

Interplane struts are of tubular steel, stream-lined with wood. The fuselage is constructed with four main longerons with wood and hard wire braces throughout.

The undercarriage is of metal construction, the wheels being large and mounted widely apart. The whole is very elastic, permitting landings on rough and uneven ground.

The motor and plane being a product of the same factory, make an extremely clean cut unit. The motor is mounted on the regular Farman motor bed and is the same type of motor which established a new world's duration record of 38 hours.

Fuel tanks are situated in the fuselage between the front and rear wing beams, an ideal position in the center of gravity of the machine. Oil reservoir is contained in the fuselage behind the motor.

For military purposes, the machine is armed with three machine guns, one firing synchronized with the propeller, and two mounted above the observer's post, giving a complete range of fire of 360 degrees.

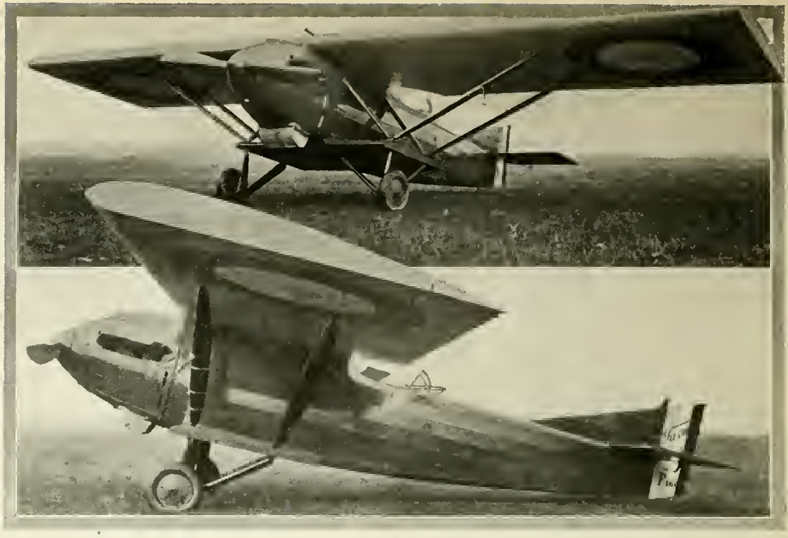
For bombing, the machine is equipped with a bomb rack placed under the fuselage between the front and rear wing longerons at the center of gravity. A box for mounting photographic apparatus is provided behind the observer, permitting either vertical or oblique photographing.

Two generators are provided, one for the wireless equipment which is both for receiving and sending, and the other for heating the equipment of the crew and for the two landing lights which are mounted on the small lower wing, one on each side of the fuselage.

Characteristics:

Span overall	48 feet
Length	34 feet 6 inches
Height	10 feet 6 inches
Total wing area	52 square metres
High speed	140 miles per hour
Ceiling	23,000 feet
Weight empty	3,300 pounds
Total load	2,200 pounds

Weight of Farman engine, complete with propeller reduction gear and accessories, 1,188 pounds. Weight of airplane without engine 2,222 pounds.



The 500 h.p. Farman type A2 reconnaissance sesquiplane.

LIGHT PLANE RECORDS

FOUR new airplane records have been classified by the F.A.I., namely: 1. Longest distance in a straight line; 2. Longest distance in a closed circuit; 3. Greatest speed for 100 kilometers; 4. Highest altitude.

For each of these there will be two categories: the first for machines weighing a maximum of 200 kilos (440 lbs.) and consuming a maximum of 12 kilos of essence per 100 kilometers; the second for machines weighing from 200 to 500 kilos with a consumption of essence less than 20 kilos per 100 kilometers.

The new competitions are expected to assist materially in popularizing the low-powered airplanes.

FOCKE-WULF SCHOOL AND TRANSPORT PLANE

THE Focke-Wulf airplane GL18C is an improved design of last year's model GL18 delivered as a sample to the German Luft Hansa. It was improved still more by the adoption of two 100 h. p. Siemens air-cooled engines which are located on the wing so that the plane of propeller is well forward of the pilot's and passengers' compartments.

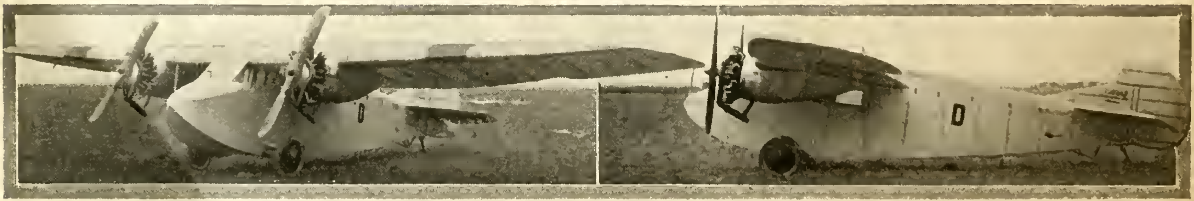
The plane is an enclosed cabin cantilever monoplane with tapered wing. It has a low chassis and deep fuselage. Pilot's and pupil's seats are side by side with dual controls having a wheel type elevator and aileron control and pedals to operate the rudder. The pilot is able to disengage the longitudinal at will so that pupil's stick becomes inoperative. The manufacturer's main aim in creating this type was to design a plane which could be used to train young pilots for operation of multimotored planes.

Trial flights indicated unusually good performance. The degree of controllability and strength of the craft can be judged from the fact that it was subjected to all kinds of stunting including barrel-rolling and looping.

In the certificate of airworthiness given out it is stated that this machine is able to fly on either of its two motors, a very good indication of efficiency. The performance of the plane as obtained from trial flights is as follows:

Performance

Maximum speed	87.5 miles per hour
Landing speed	52.5 miles per hour
Climb in 5.8 minutes	3280 feet
Ceiling	13,120 feet
Wing area	344 square feet
Span	52.6 feet
Length overall	8.55 feet
Wing loading	10.55 pounds per h. p.
Power loading	18.21 pounds per h. p.
Weight empty	2,634 pounds
Fuel and useful load	1,005 pounds
Gross flying weight	3,640 pounds



The twin-motored 200 horsepower Focke-Wulf type GL18C school and transport monoplane.

95% of commercial aircraft corporations use Berry Brothers' Aircraft Finishes

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- Louis Breguet Aeroplane Works
- Buhl Aircraft Co.
- Cole Aircraft Corp.
- Edo Aircraft Co.
- G. Elias & Brother, Inc.
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- Hartzell Walnut Propeller Co.
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IT is a matter of more than passing significance that Aircraft Berryloid, Lionoil and others of Berry Brothers' progressive aircraft finishes are now used by 95% of the commercial aircraft manufacturers in America.

It is also significant that the French government specifies certain of these finishes for use on all military and naval planes and that prominent French builders of commercial ships import Berry Brothers' aircraft finishes in carload lots.

Surely it would be impossible for higher tribute to be paid—or more eloquent testimony given—to the outstanding superiority of aircraft finishes made by Berry Brothers.

Address Marine and Aviation Department for full information and color cards.

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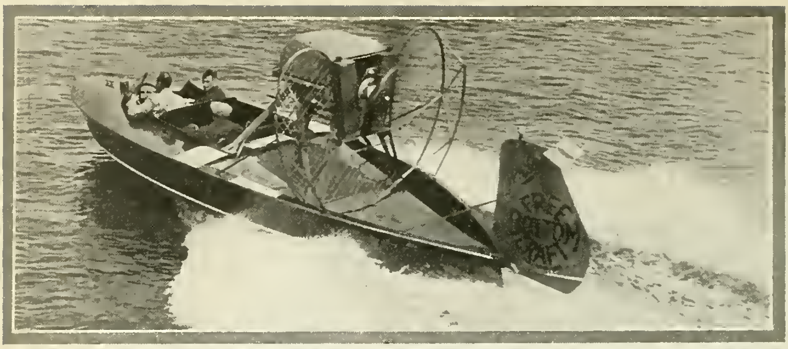


George Post piloting his latest type propeller driven water craft, the "Whistler."

THE WHISTLER

THE aircraft industry has produced a new vehicle for high-speed water travel which undoubtedly is winning great favor among sportsmen along the coasts and on inland waterways. It is the "free bottom" boat made possible by using the airplane engine and propeller as a means of propulsion. George B. Post, the designer and builder, has combined in the "Whistler" a knowledge and experience of boats and aircraft construction with the result that it can be easily navigated in an inch of water or out in the open sea. For flyers and those who fly for the pleasure and thrill of it, the Whistler offers many of the thrills of "hedge-hopping." You can skim at a speed of 30 to 35 miles per hour along the edges of the shore and shoot through openings so narrow and shallow that they have been closed heretofore to all craft except canoes and very light skiffs. To duck-hunters and those who take their relaxation on the water, the Whistler opens endless possibilities for exploring little-traveled water ways, in the utmost comfort and without the exasperation of pushing and hauling a boat over mud flats.

Unmistakable signs of the best airplane practice are apparent in the general design. The hull is of the V-bottomed type, customary in our most modern flying boat hulls, brought out wider and flatter aft and braced throughout at the critical points in the usual seaplane manner, a method of obtaining the lightness and strength which flying construction requires. The bottom is double and the planking laid at 30° with fabric and marine glue between and the whole surface copper riveted together. The Curtiss OX5 airplane motor of 90 h.p. was chosen after a careful survey of the entire automotive field on account of its simplicity and known record for dependability and performance. It is supported on struts on the after-deck and swings an 8 ft. walnut propeller completely protected by a heavy wire screen. Two automobile radiators supply cooling without the danger of salt water corrosion and the frequent possibility of fouling from sand and mud.

One of the most interesting features of design is the rudder, for that presented the only obstacle to a truly free bottom. It is hung on out-riggers in the air blast of the propeller and is supported entirely above the water. It proved its advantage from the very beginning and gave a light sensitive control which is rarely approached in the usual type. Slow speed steering with the absence of the blast from the propeller was finally responsible for the development of the combined air and water type which automatically shifts from one to the other as conditions require.

The Whistler is the result of over thirteen years of development work and actual building of air driven motor boats. It is a thoroughly proven product in every respect. Low seats and low center of gravity combined with a generous beam give stability under all conditions and banks the boat in on turns at any speed.

Specifications

Length over all	23 feet 6 inches
Beam	7 feet 3 inches
Draft (floating at rest)	9-10 inches
Draft (planing at speed)	4-5 inches
Speed	30-35 miles per hour
Gasoline consumption	3-4 miles per gal.
Length (stem to tip of rudder)	26 ft. 4 in.
Beam (including propeller guard)	8 ft. 8 in.
Height (propeller horizontal)	7 ft. 3 in.

AIRCRAFT EXPORTS INCREASE IN 1926

DURING the calendar year 1926 the value of United States exports of aircraft engines, aircraft and parts increased almost one-third over those of 1925. Specifically they increased $255,270 over the 1925 total of $783,659 and thus showed a valuation of over one million dollars in the past year. This is very encouraging in view of the number of sales made in Latin-America by European companies during the past year, American manufacturers finding their prices very difficult to meet due to European currency depreciations.

The greater part of our increase was registered in aircraft engines, the number of units showing an increase from 73 valued at $170,793 in 1925 to 855 with a valuation of $583,758 in 1926. However, the average engine unit value decreased over two-thirds during the same period indicating that there was a much greater percentage of salvage types exported in the latter year.

The number of planes exported increased from 80 to 85 units during the same period. Here again the unit value decreased materially as the 1925 exports of planes were valued at $511,282, while their value fell to $304,842 in 1926. Airplane parts showed an increase of nearly 50 per cent, increasing from a valuation of $101,584 in 1925 to $150,329 in 1926.

The United Kingdom was our leading market for aircraft products in 1926 taking $281,050 of the total. Second place was taken by Soviet Russia in Europe with our exports to that country totalling $270,739. Peru took third place with $120,231. Mexico fourth with $85,459, and Canada was fifth, our exports to the Dominion being valued at $47,276.

The latest Boeing Navy "Shipboard Fighter" with Pratt and Whitney engine.

PERFECT
COMFORT

RYAN BROUGHAM
FIVE-PLACE CLOSED PLANE

180 h. p. Hisso-equipped,	$5,150
Wright Whirlwind-equipped,	9,700

"The plane that pays a profit"

RYAN AIRLINES, INC.
San Diego, California

AL·ESSIG

WESTERN NEWS

Captain Chas. A. Lindbergh and B. F. Mahoney of the Ryan Airlines.

INTERNATIONAL AIRCRAFT CORP. NOW ON A PRODUCTION BASIS

THE International Aircraft Corporation is now building a complete line of aircraft for commercial use.

They are in production on a 3-place ship to be powered with OX5 or Whirlwind engines. This ship has remarkable stability qualities and has been flown in all kinds of weather, without using the stick. Controls can be released in a stall or in any other position and the ship will resume a level flying position without assistance from the pilot.

The *Violet,* one of the types of ships, is well known on the Pacific Coast, having entered several of the air meets in the past year. It took second place in the "Around the World" Commemoration Meet, at Clover Field, Santa Monica, Calif., in 1926, flying the complete course with the ailerons disconnected, making landings at Long Beach, Santa Ana, Arlington, Alhambra and Clover Field. Since that time the ship has been checked over a marked course at 107 m.p.h. The Burdett Airlines, Inc., Los Angeles, and W. O. Kane of Long Beach have received their demonstrators.

The company is also in production on their 5-place commercial ship, which can be powered with any motor from 150 to 300 h.p. They recently delivered an 8-passenger Liberty motored ship, which is the first of several of a similar type to be operated between Los Angeles and the Imperial Valley, by Mr. Jeff Warren and Mr. Nick Galloway.

FLYERS DASH TO SNOW-BOUND TOWN

FLYING thousands of feet above the icy peaks of the continental divide, through gales and blizzard, Lieut. Danny Kearns and Master Sergt. Plank of the Colorado National Guard delivered mail, the *Denver Post* and antitoxin from Denver to the snowbound town of Silverton.

This Douglas plane carried a total weight of 5,592 pounds over the divide through a mountain pass near Child's peak. The flyers brought back the first photographs of the isolated city.

WARREN SCHOOL GETS WACO FOR TRAINING

KEEPING abreast of the rapid expansion of student activities, the Warren School of Aeronautics have just placed an order with the American Aircraft Corporation, California Waco distributors, for their first Waco training ship.

LINDBERGH TO TRY TRANSATLANTIC HOP

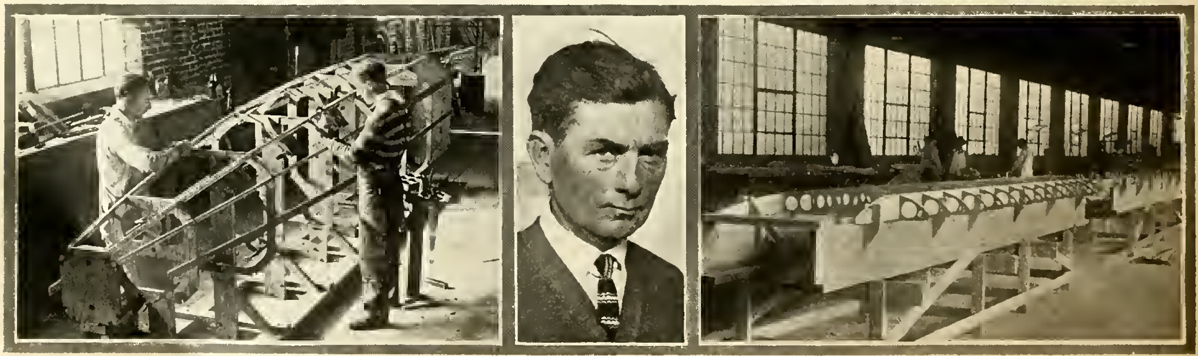
THE St. Louis-New York-Paris flight was conceived in the mind of Captain Charles A. Lindbergh, Mo. N. G., a St. Louis to Chicago air mail pilot. He will be entered for the Raymond Orteig prize of $25,000 in competition for a non-stop flight from New York to Paris.

Captain Lindbergh is twenty-five years old, tall, slender, unassuming, and is ideally fitted and trained for the daring and hazardous task of a solo flight across the Atlantic. He has the distinction of having four times stepped out of planes and landed with a parachute—once at Kelly Field in a mid air collision with a combat plane at 5,000 feet altitude, in 1925; later in testing a civilian plane, and twice on the St. Louis to Chicago Air Mail run.

Captain Lindbergh will fly a Ryan M-2 manufactured by the Ryan Airlines, Inc., of San Diego, California. The flight is made possible and is being financed by a group of St. Louis business men and sportsmen who are friends of Captain Lindbergh.

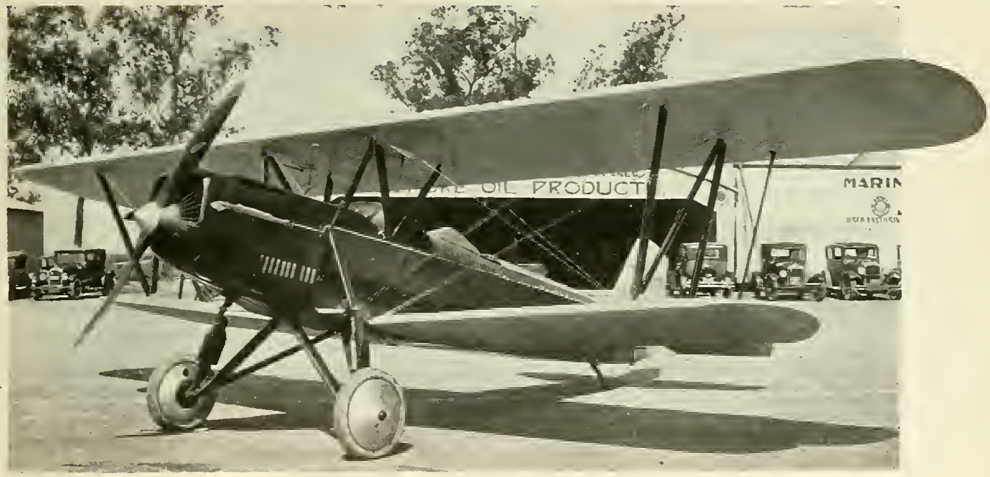
The plane which is now under construction at the Ryan factory will be powered with a single engine and with the exception of the larger wing spread and fuel capacity sufficient for a 4,000 mile cruising radius is similar to the stock model Ryan M-2. It will have a 46-foot wing spread. The gasoline capacity will be 425 gallons. A high speed of 130 miles per hour and a cruising speed of 105 miles per hour is predicted. The plane will be equipped with all modern available equipment such as earth inductor compass, bank and turn indicator, drift meter, and inclinometer. It will be of the semi-enclosed type streamlined similar to the regular Ryan Brougham model.

It is hoped to have the plane completed by the latter part of May so that the flight may be made by the middle or the last part of June in order to take advantage of the longest periods of daylight. Plans have been speeded up by day and night work in an effort to have the plane ready for the dash across between June 15th and 22nd.

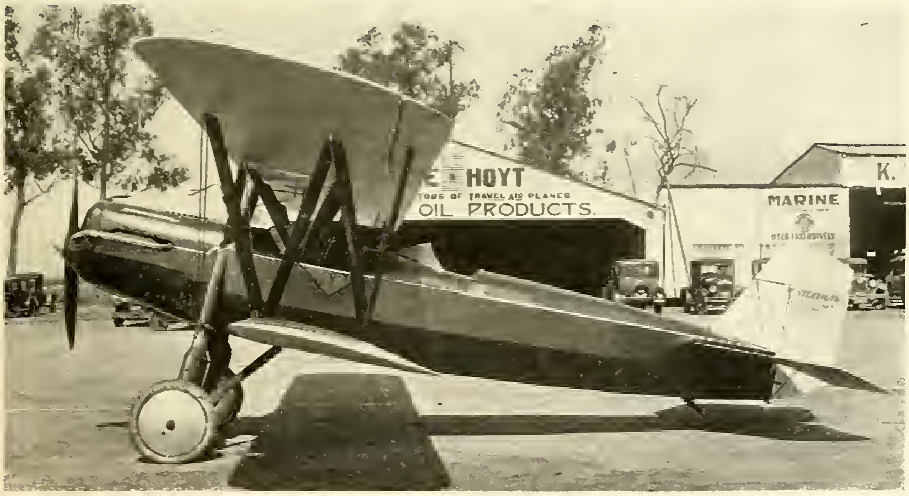


Construction views and chief designer E. M. Fisk of the International Aircraft Corporation.

Forecasting the trend of Aeronautical Development



THE UNMISTAKABLE STAMP OF QUALITY



Details and data on request

VENICE
CALIF.

STEARMAN
AIRCRAFT
INC.

353 THIRD AVENUE

A YEAR WITH THE AERO CORP. OF CALIFORNIA

ONE year ago the old Burdett Airport was purchased from its original owners by a group of five men who immediately re-organized the company under the name of The Aero Corporation of California. These men, Lieut. Jack Frye, Charles S. Reynolds, Richmond A. Edwards, Lieut. Paul E. Richter, Jr., and Walter A. Hamilton, realized the possibilities of commercial aviation and set about to raise their company out of the 'airport' class and establish it on the plane occupied by 'big business'. The Aero Corporation of California gave a snort, took on life, and prospered. Today it is acknowledged to be one of the largest and most progressive aviation companies in the entire West. A financial report recently issued to cover the fiscal year of this corporation shows a net gain of over 600 per cent of business since the reorganization.

At the time of the reorganization Lieuts. Frye and Richter were placed in charge of the flying and their first endeavor was to make the Flying School as nearly perfect as possible. A course almost identical to that given by the United States Government was decided on and put into practice. A minimum of twelve hours time in the air is required in this course. The school has had tremendous success.

A motor shop and a sales company was also organized, the former in charge of Walter Hamilton whose reputation as an expert aviation-motor mechanic is well known in the west. Under his management the motor repair shop was placed on a paying basis. Five mechanics are now employed

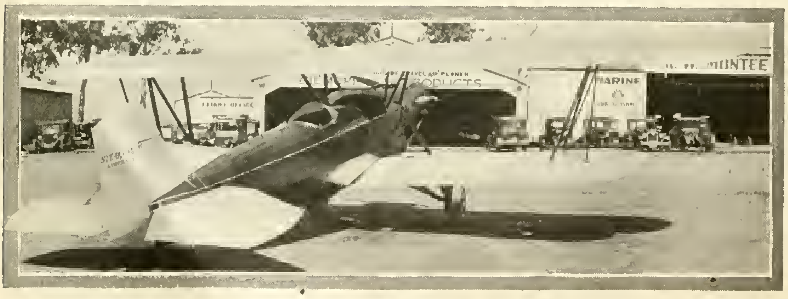
Monte Edwards directs the sales company and that department's first move was to secure the Eaglerock distributorship in Southern California and Arizona, and has made a big success in the sale of these ships. The aim of the sales company has been to establish a closely organized chain of dealers throughout the west and with this in view disposed of all war surplus stock and secured modern parts, supplies and accessories and obtained the western distributorship of modern aviation necessities.

Among the Aero Corporations achievements for the past year are the winning of the 'Round the Southland Race, the High Speed Race, and the Altitude Contest in the light commercial class at the World Flight Commemoration Air Meet held at Clover Field. Jack Frye of the Corporation has the distinction of being the first person to make a successful flight in a land plane to Catalina Island, and Paul Richter holds the official world's altitude record for planes with 100 h. p. or less. The Corporation planes have carried during the year 8,127 passengers, many hundreds of pounds of express and freight and have covered 150,000 miles. To do this the planes made 5,249 flights of an average duration of twenty-two minutes each. None of their ships have been in any accidents resulting in even minor injuries to the passengers. During the year the members of the Corporation were appointed the official Aero Squad of the Los Angeles County Sheriff's office and an Eaglerock was selected by the Sheriff as a most suitable plane for the official use of his Aero Squad.

The starting of a new fiscal year finds the personnel of the company unchanged except in one instance occasioned by Charles Reynolds selling his interest to Lieut. Charles W. Cradick. The Corporation has moved to a new field at Western Avenue and 99th street which they have leased from the City of Los Angeles for a period of ten years and work is now progressing to make this field a model airport. New hangars and shop buildings are being erected.

Los Angeles Daily News.

Distributing Aero Digest to Southern California air fields by airplane. February copies dropped with a parachute from an Alexander Eaglerock airplane.



Lloyd Stearman's new commercial plane at Santa Monica, California.

A STEARMAN TRIUMPH

By Frank E. Samuels

THROUGH the courtesy of the Stearman Aircraft Corporation and with Fred Hoyt, winner of the Sesquicentennial "On-to-Philadelphia" race, as pilot, I had the pleasure of making the first official passenger carrying flight in the first biplane built by the Stearman Corporation, using the plane to make the delivery of the March issue of Aero Digest on the fields of Southern California.

We loaded the magazines in the front cockpit and took off from Clover Field, Santa Monica. I was greatly surprised with the smooth take-off, until I remembered that the plane was equipped with the new hydraulic landing gears. Before I realized it, we were in the air and climbing fast, crossing the Santa Monica mountains at a height of 2,500 feet, and landing at the Kinner field, Glendale, in less than 15 minutes. The field is short and pretty rough in places but the Oleo shock absorbers made the landing with perfect smoothness.

Taxying up to the Kinner factory the wheel brakes showed their efficiency, Fred turning the plane around in very little more than the length of the plane. The brakes can be used individually as well as in unision.

The short field did not hamper us in taking off as we were well up in the air after covering one-half the length of the field. From Glendale we made the rounds of the fields delivering the Digest, the plane causing favorable comment wherever we landed.

The large, comfortable cockpit, well-upholstered for its passengers is a comfort to ride in and the performance of the ship must be a great pleasure for any pilot flying it. The motor was the same OX5 with which Hoyt won the "On-To-Philadelphia" race which was used to prove that the ship would give good performance with an OX5. It will be replaced with a 200 h. p. motor, for which the ship was built.

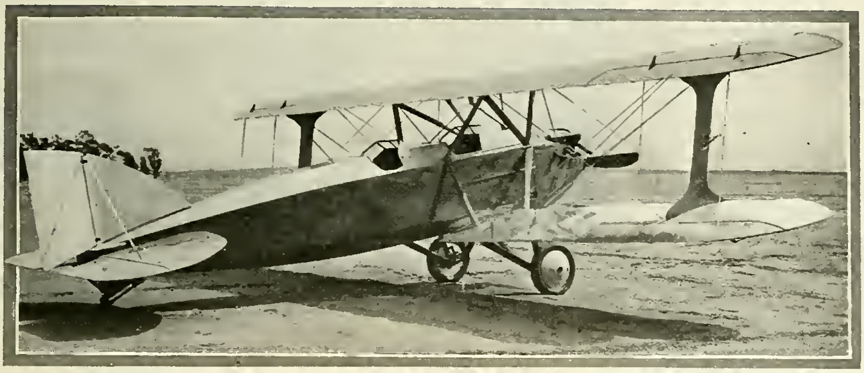
Lloyd Stearman has gained new laurels in the designing and building of this, his latest engineering feat, and Fred Hoyt, George Lyle and the other members of the Stearman Aircraft, Inc. may well feel proud to market a plane of this high class performance.

VISITING BY PLANE

DURING the last full moon, Joe Skidmore, head of the Skidmore Real Estate Corporation of Laguna Beach, Calif., who is one of our greatest aviation boosters, having his own private hangar close to his beautiful home at Laguna, invited some of his friends to fly over for dinner and a whist game.

Taking advantage of the invitation Earl S. Daugherty and wife flew from Long Beach, Eddie Martin and wife from Santa Ana and Lieut. Thomlenson and wife from San Diego.

All arrived at the field before dark and roamed the beach enjoying the sunset and balmy air until dinner, after which they spent a pleasant evening at cards. By the light of the moon they took off and flew back to their respective fields.



INTERNATIONAL F-18 SPECIAL 4-PLACE 180 H. P. HISSO JOB

BUILT-TO-A-STANDARD—
NOT-TO-A-PRICE

When you buy, BUY AIR TRANSPORTATION —not just an airplane

AS we build airplanes, we have our eyes and our minds on the transportation each piece is going to yield to the owner. Let that owner appraise his transportation on whatever basis he chooses—dollars earned—hours flown—pounds carried—we build to give him the MAXIMUM in air transportation.

The successful dealer, from now on, must be in a position to furnish any size aircraft demanded.

Dealers will appreciate the value of being affiliated with a manufacturer who is building a complete line.

Edwin M. Fisk, *Chief Designer and Engineer*

INTERNATIONAL AIRCRAFT CORPORATION

SPRING AT PACIFIC, LONG BEACH, CALIFORNIA

DEALERS WITH DEMONSTRATORS:

Burdett Air Lines, Inc., 94th and Western, Los Angeles, California
W. O'Kane, c/o Municipal Airport, Long Beach, California

THE WARREN SCHOOL STRESSES NAVIGATION

"NO pilot should be licensed to carry passengers who has not had an adequate training in aerial navigation. Everyone knows how strict maritime laws are regarding the qualifications of a navigator, and it is just as imperative that pilots of passenger planes should understand the principles of navigation, know how to read maps and charts, to read a compass and correct it for error, to check drift, and should have a working knowledge of meteorology."

This is the comment of Col. G. C. R. Mumby, vice-president and general manager of the Warren school of Aeronautics in Los Angeles, who announces that the final three weeks of their flying course includes aerial navigation and meteorology, under the direction of Capt. T. C. Wilkinson, chief instructor, who had a thorough training in both while serving with the British naval flying forces. Capt. Wilkinson received his part of his training at Kalshott under Commander Creigh-Osborne, inventor of the Creigh-Osborne aviation compass.

NEW MONTANA SCHOOL

MONTANA'S first aviation school opened on March 15 at Butte, Montana, and is run in connection with the Butte National Airport. The airport was established in 1922, and is the most up-to-date aviation field in this part of the country. It is a 200-acre marked and graded field, equipped with a steel hangar and wind cones, and can accommodate the largest ships with ease.

The school is called the Montana Aviation School and is one of the highest altitude schools in the country.

THOSE CATALINA SWIM AERIAL PHOTOGRAPHS

THE aerial photographs of the Catalina Island swim proved to be one of the biggest photographic "scoops" of the year. The story of this remarkable flight, the first plane to cross the channel and land on Catalina, was carried in the March AERO DIGEST. Harry Steiger, not Sanders as appeared in the March issue, manager of the Los Angeles Bureau of P. & A. photos, by means of the excellent performance of the Aero Corporation of California's Eaglerock plane and the telephone got his pictures into the eastern papers before anyone else reached Los Angeles with their photo plates.

Col. Mumby, general manager, and C. A. Warren, president, of the Warren School.

"I LIKE AERONAUTICS".

BY DON HOGAN

AND I certainly convinced myself of that fact when I looked at the old check stub and found that I had spent $15,000 hard earned dollars back in the year 1919 to outfit myself with one Curtiss Oriole, a reasonably fine hangar, a good course of flying instruction, and the necessary flying togs. This investment was made with just one thought in mind—to satisfy a desire to know how to fly and really enjoy all the thrills that go with this mode of travel.

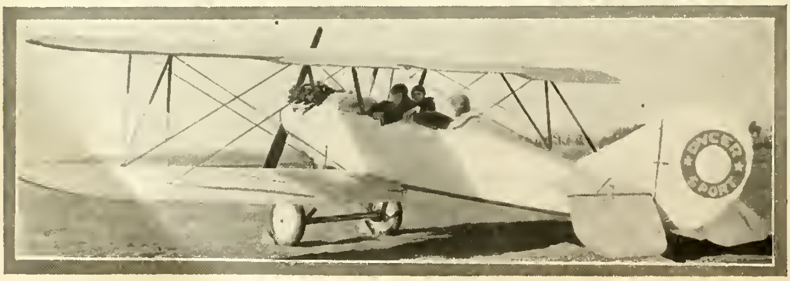
It proved to be a fine expenditure, and the pleasure derived more than offset the original investment; but by the end of the first year of ownership, real things began to happen. I found out that the firm of Don Hogan, Incorporated, and that the name of the writer, was better known in connection with aviation with only one year's connection, than they were in the automobile business after twenty years of consistent plugging and advertising. This brought about a valuable asset to our organization—a name that was nationally known, resulting in our being offered the choice of distributing accounts, and in the finale the obtaining of one that was mighty valuable.

I formed a company known as The Colorado Airways Incorporated and began some real business-like administration under the management of Earle K. Parker, a former Army man and now a First Lieutenant in the Flying Reserve. Ships were rebuilt and sold, new ones added and a real year's activity resulted in a satisfactory income to the new company. We prepared ourselves for the securing of the mail contract upon which bids were called for covering the route between Pueblo, Colorado, and Cheyenne, Wyoming.

Now came the time for the big decision,—should the writer give up the fast growing new commercial venture or continue to spend his time with his already twenty-year established business of automobile distribution?

The price offered for the Colorado Airways by A. F. Joseph, its present owner, helped me to decide to remain for the time being at least in the old occupation. So with a solemn vow to break back into aviation within the next two years in a manufacturing way, I accepted the check. Again, without any credit due me for farsightedness, aviation had laid on my table another large compensation which was far larger than the original sum.

I would not miss the next ten years in this fast growing business!



The Dycer three-passenger OX-5 engined sport plane at Los Angeles, Cal.

SIX KINNER AIRSTERS ORDERED FOR THE EAST

ORDERS for six Kinner Airsters have been placed with the Kinner Airplane and Motor Corporation by Harold T. Dennison, president of the U. S. Investment Company and of the Dennison Motor Car Company, Boston, Mass., who has been appointed distributor for the entire New England territory for Kinner planes and motors.

Mr. Dennison before ordering the California built planes made a tour of inspection to the leading commercial airplane factories in the United States selecting the Kinner Airster as the plane most suited to the needs of the private aviator.

The first of the planes will be delivered within 60 days, the remainder will go forward at regular intervals until the contract is filled.

The Kinner plant will add fifteen additional men to its staff immediately, to keep up with the new orders.

The planes will all be powered with the new model K-2 100 h.p. radial air-cooled motor recently successfully developed by the Kinner organization.

Safety

Comfort

Economy

BACH
AIRCRAFT
COMPANY

1917 - 1927

CLOVER FIELD SANTA MONICA
CALIFORNIA

STUDENT FLYERS

Our school of flying uses new and modern ships (**WACOs**) in all phases of instruction. Students learn quicker and make better pilots; and the cost is much less.

Do not enroll for training leading to pilot's license without looking over the instruction equipment.

Our staff of instructors, headed by Frederic Whitney, dean of Pacific Coast aviators, is thoroughly qualified.

Learn to fly in the romantic and glorious land of El Camino Real, where *every day is a flying day.*

◆

American Aircraft Corp.
Offices: Third Floor Merritt Building,
LOS ANGELES, CALIFORNIA

Hangars and School at Clover Field

KINNER

The NEW KINNER AIRSTER
equipped with
The NEW KINNER 100 H. P.
RADIAL AIRCOOLED MOTOR

makes an ideal 3-place general UTILITY airplane for every day use

KINNER AIRPLANE and MOTOR CORPORATION
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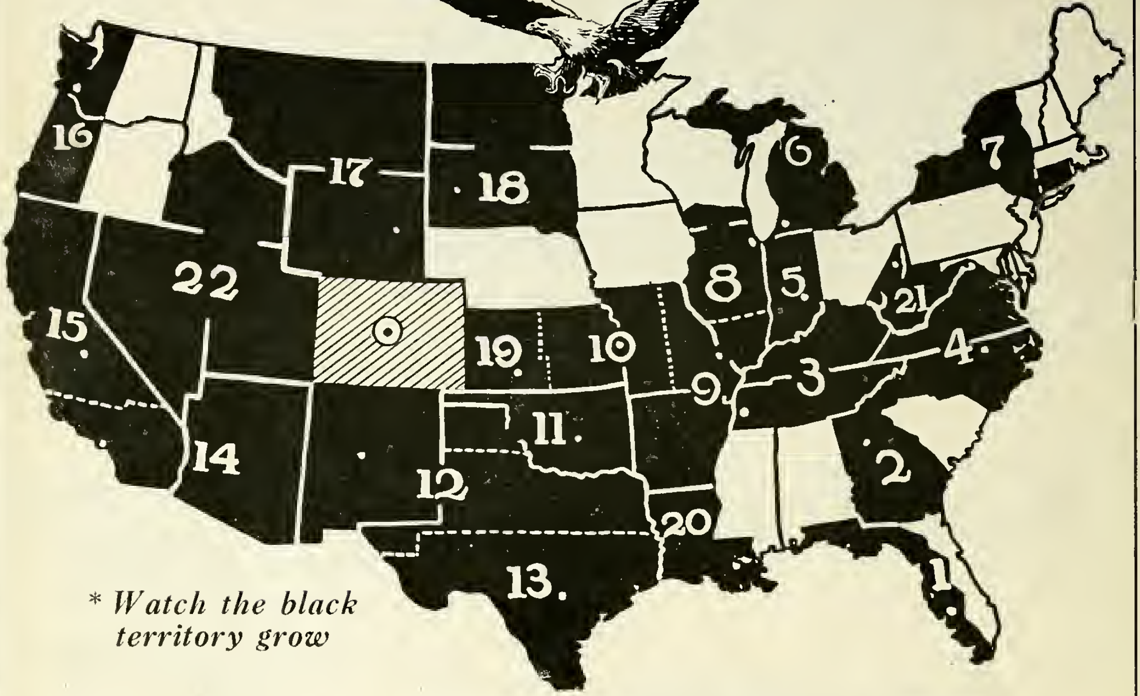
415 Quincy Shore Dr. Atlantic, Boston, Mass.

Distributor for San Joaquin Valley and Northern California
Leroy Miller
Porterville, California

ALEXANDER EAGLEROCK



* Watch the black territory grow

What Does It Mean?

IT means the largest light commercial airplane sales force in the world.

IT means that 23 dealers have purchased demonstrator Eaglerocks and have each been assigned exclusive territory.

IT means that there are but few choice territories now open for a dealership. (Note—Mississippi closed as this goes to press.)

IT means that in the numbered territories these dealers are open for more sub-dealers and representatives.

IT means that the Alexander Eaglerock has become America's most popular light commercial ship.

THERE'S A REASON

CASH $2475 DENVER

—or may be purchased on the

TIME PAYMENT PLAN

with new insurance feature

For details address—

ALEXANDER AIRCRAFT CO.
Room 403, Denver, Colorado

EAGLEROCK DEALERS

1—West Coast of Florida—*Wesley N. Raymond, Puntagorda, Fla.*
2—Georgia—*Georgia Airways, Inc., Candler Field, Atlanta, Ga.*
3—Ky. and Tenn.—*Datin Eaglerock Sales Co.,* 2031 *Central Avenue, Memphis, Tenn.*
4—No. Carolina and Va.—*Charles Flying Service,* 3100 *Garland, Richmond, Va.*
5.—Indiana—*Captain J. A. Yonge, Box* 1185, *Indianapolis, Ind.*
6.—Michigan—*Niles Airways, Niles, Michigan.*
7—N. Y. and Conn.—*T. D. S. Aerial Service Inc.,* 35 *W.* 23*rd St., New York City*
8—Ill. and So. Wisc.—*Seivert Aircraft Corp.,* 5934 *So. Cicero, Chicago, Ill.*
9—E. Mo., Ark. and So. Ill.—*Bridgeton Aircraft Corp.,* 223 *Pierce Bldg., St. Louis.*
10—W. Mo., E. Kan.—*Bennett Eaglerock Sales Co.,* 223 *W.* 12*th St., Kansas City, Mo.*
11—Okla. and Tex. Panhandle—*Southwest Airplane Sales Corp., Britton, Okla.*
12—N. M. and Central Tex.—*Swastika Eaglerock Airways,* 312 *Columbia, Albuquerque.*
13—Southern Texas—*Marion P. Hair, P. O. Box* 420, *San Antonio, Texas.*
14—So. Cal. and Ariz.—*Acro Corp., of Cal., Western Ave., at* 104*th St., Los Angeles.*
15—No. Cal.—*Lester Lamkin, Porterville, Cal.*
16—W. Washington and W. Oregon—*J. B. Story, Sand Point Field, Seattle, Wash.*
17—Wyoming and Montana—*Wyoming Airways, Casper, Wyoming.*
18—So. Dakota and No. Dakota—*Rapid Air Lines Inc.,* 1*st Nat. Bk. Bldg., Rapid City, S. D.*
19—Western Kansas—*C. E. Stecle, Dodge City, Kansas.*
20—La.—*Louisiana Airways,* 1712 *Pere Marquette Building, New Orleans, La.*
21—W. Virginia and E. Ohio—*Lyle E. Scott,* 328 - 2*nd St., Marietta, Ohio.*
22—Utah, Nevada, So. Idaho—*Rocky Mountain Airways, Salt Lake City, Utah.*
23—Mississippi—*Dixie Aircraft Service, Bry Block Mercantile, Memphis, Tenn.*

ALEXANDER AIRCRAFT CO.

ALEXANDER EAGLEROCK

TRADE MARK REG.

Exclusive Dealer

OKLAHOMA and TEXAS PANHANDLE

Complete shop equipment for repairs. Night or day service—gas and oil. Flying instructions in new ships.

FIELD

—at Oklahoma City Airport, four miles north of State Capitol.

SOUTHWEST AIRPLANE SALES CORP.

R. H. Tarbutton, Pres., Britton, Oklahoma

Exclusive Dealer

IN THE STATE OF MICHIGAN

An economical, safe, dependable, OX5 plane that will take you anywhere with the minimum of cost—and the maximum of safety. Buy it on the Time Payment Plan and let it pay for itself.

LEARN TO FLY IN 1927 PRODUCTION SHIPS.
NO BOND FOR SOLO.

NILES AIRWAYS, NILES, MICH.

NEW MEXICO — CENTRAL TEXAS DEALER

— also subdealer in El Paso and Hudspeth Counties

"Boys, this country is high and hot, that's why we chose the Eaglerock."

— EVERYTHING IN AVIATION —

SWASTIKA EAGLEROCK AIRWAYS

312 Columbia, Albuquerque, N. M.

Exclusive Dealer

NORTH and SOUTH DAKOTAS

FOR SIGHTSEEING TRIPS—

over the Black Hills and the Bad Lands of South Dakota we needed the Eaglerock for security. Its equal in a light ship has never been built.

RAPID AIR LINES, Inc.

First National Bk. Bldg., Rapid City, S. D.

Exclusive Dealer

KENTUCKY AND TENNESSEE

20 YEARS

—experience in buying for a mercantile business has kept me on the alert for dependable merchandise. That's why we're selling the Eaglerock.

S. E. DATIN.

DATIN EAGLEROCK SALES CO.

2031 Central Ave., Memphis, Tenn.

WESTERN MISSOURI—EASTERN KANSAS

Exclusive Dealer

Complete Flying Course—15 Hrs.—$200

All instructions in new Eaglerocks.

The last 5 hours are devoted to cross country flying and map reading.

Our Graduates Are Real Pilots

We give advanced training to graduates from other schools.

We Trade New Ships for Old—Used Planes for Sale.

BENNETT-EAGLEROCK SALES CO.

223 West 12th St., Kansas City, Mo.

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Exclusive Dealer

EAGLEROCK

Sub-dealers and Representatives WANTED

STUDENT TRAINING AT REASONABLE RATES

CAPT. J. A. YONGE

P. O. Box 1185, Indianapolis, Indiana

PERFORMANCE WITH ECONOMY

NEWS OF THE AIR SERVICES

"SHIPBOARD FIGHTER" PLANES BEING TESTED

THE first of the secret tests of the new type "shipboard fighter" airplane designed for use on battleships and cruisers were held at the Naval Air Station at Anacostia, D. C., March 15th.

Three planes are being tested: one entered by the Curtiss Airplane and Motor Company of Garden City, N. Y.; one by the Eberhart Airplane Company, of Buffalo, N. Y.; and one by the Boeing Airplane Company of Seattle, Wash.

The Curtiss entry is described and illustrated on page 276 and 277 of this issue; the Eberhart plane, on page 298; and the Boeing fighter, on page 304.

PAN-AMERICAN FLIGHT

TRAGEDY overshadowed the Pan-American Good-Will Flight when Capt. C. F. Woolsey and Lt. J. W. Benton, both U.S.A., of the plane *Detroit*, were killed in a collision between the *Detroit* and the flagship *New York* as the planes were preparing to land at Palomar, Argentina, near Buenos Aires, Argentina, Feb. 26. Maj. H. A. Dargue and Lt. E. C. Whitehead, of the New York, escaped death in the crash by using their parachutes.

The *San Francisco* and the *St. Louis* hopped off from Buenos Aires, Argentina, in continuance of the 20,000-mile flight, arriving at Asuncion, Paraguay, on March 2. The *San Antonio*, which was left behind in Colombia, arrived at Senilosa, Argentina, the same day, and in Bahia Blanca on March 3. The *St. Louis* and *San Francisco* then flew to Montevideo, Uruguay (March 4), and proceeded northward along the coast of Brazil to Rio Grande do Sul, Santos and Rio de Janeiro (March 10).

They then started on the fourth division of the flight which took them to Porto de Pedras, Victoria, Pernambuco and Port Natal (March 20); thence to Sao Luiz de Maranhoa and Para, Brazil (March 21). The squadron reunited on March 22 when the *San Antonio* arrived at Para. They are scheduled to arrive at Trinidad on March 27.

RS-1 NOSE BATTENS

NOSE battens, or stiffening members for the envelope of the U. S. Army Air Corps semi-rigid airship, RS-1, are now being installed at Scott Field, Belleville, Illinois, by Army engineers assisted by a small staff of men from the aeronautical organizations of The Goodyear Tire and Rubber Company and its subsidiary, the Goodyear-Zeppelin Corporation.

The new nose member arrangement, designed by Goodyear men in Akron and manufactured there during the past six months, is expected to add to the efficiency of the RS-1 and make possible maximum flying speeds of more than 75 miles an hour.

CAPTAIN GRAY SETS NEW BALLOON RECORD

By Thomas Parry, Jr.

HAVE you ever dreamed of walking off a high cliff and falling ever so fast, perhaps 500 or 600 feet a minute, through space? It is a creepy, rather sickening feeling. Of course you awake before you strike bottom. It's the sort of dream no one likes to experience very often.

On March 9, Captain Hawthorne C. Gray, stationed at Scott Field, Belleville, Ill., dreamed that he was falling through space. He awoke before he struck earth, but nevertheless, was still falling—actually falling at the rate of 1 000 feet a minute. He had ascended in an Army balloon to attempt to establish an altitude record. After he had attained an altitude of 27,000 feet, he fainted and did not regain his senses until the balloon had descended to an altitude of 17,000 feet and was traveling earthward at a terrific rate. By working frantically, Captain Gray managed to heave over ballast enough to reduce the rate to 500 feet a minute. A crash through telephone wires further tended to slow up the rate of descent. He landed in a ditch with only a sprained ankle.

Improperly adjusted tubes failed to supply him with sufficient oxygen from the three tanks in the balloon basket.

The United States Bureau of Standards has just announced that the true altitude mark reached by Captain Gray was 28,510 feet. While this mark failed to eclipse the present world's altitude record for free balloons, 35,424 feet, held by the German aeronauts Suring and Benson, it did surpass the American altitude record of 15,997 feet attained by Clifford B. Harmon in 1909.

Capt. H. C. Gray and Col. J. A. Paegelow

PLANES ORDERED FOR THE ARMY AND NAVY

THE Navy Department has awarded contracts for 130 airplanes with an aggregate purchase price of $1,708,967. The Ford transport plane was purchased for $40,000 and will be used as a test plane by naval aviators.

A contract for $672,867 was made with the Consolidated Aircraft Corporation of Buffalo, N. Y., for 70 NY-1 training planes and spare parts.

The Boeing Airplane Company of Seattle, Wash., was awarded a contract for 32 F2B1 planes and spare parts amounting to $515,650.

Twenty-seven F6C-4 pursuit planes have been ordered from the Curtiss Airplane Company at a cost of $480,450.

Contracts for equipment for the Army Air Corps were let amounting to $1,465,000. Forty-five Curtiss O-1 planes, 10 Curtiss O-11 and 9 Loening amphibian planes have been ordered.

SELFRIDGE FIELD NEWS

By Roy A. Philblad

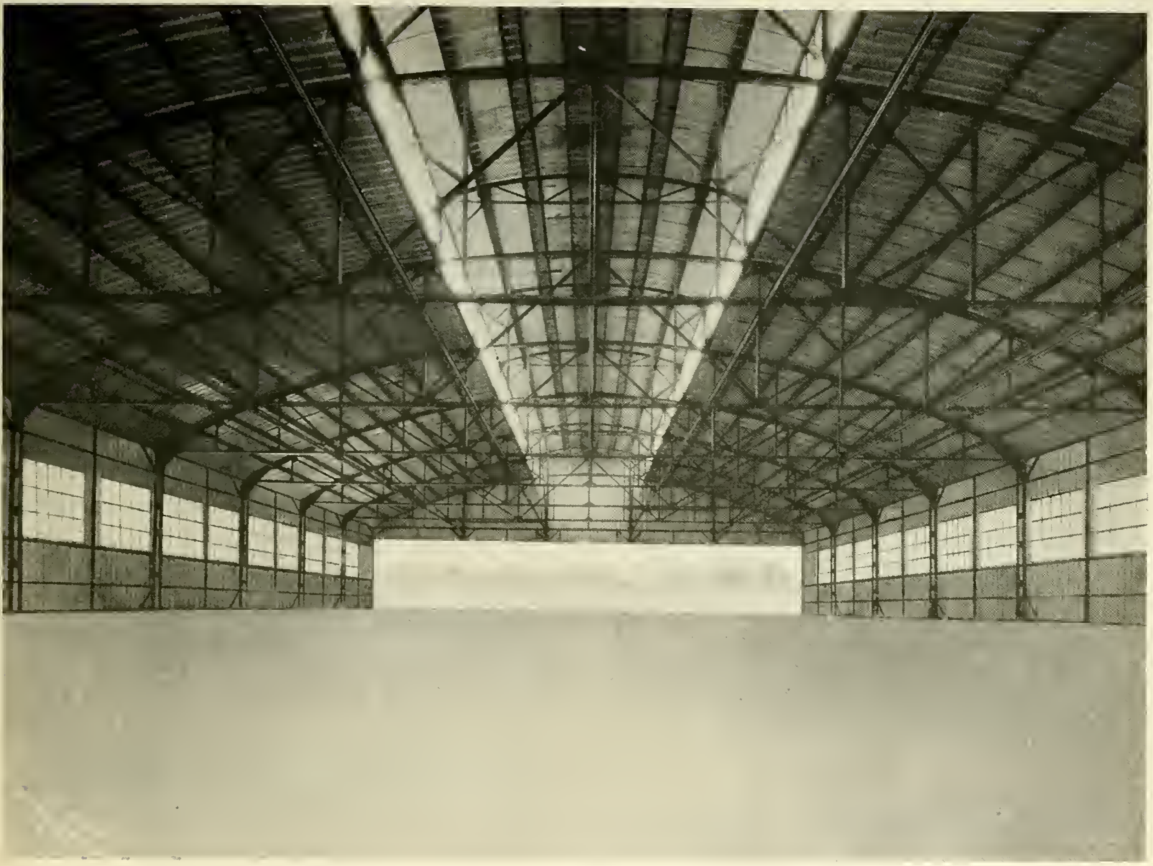
NOW that the war department has decided to make a permanent base out of Selfridge, the First Pursuit Group, America's only unit of pursuit planes, is definitely established here. Congress has appropriated $850,000 for permanent buildings and construction work will start as soon as plans are approved at Washington. Along with the new buildings and arrangements, the War Department has ordered the group increased to full strength.

Major Thomas G. Lanphier, who commands the group, was first transferred to Selfridge on Sept. 10, 1924. The Field was not considered permanent and was going to be transferred to Texas. At the time he had 12 pursuits with which he began work immediately to show the advantages of having a field near the border and in the middle west. The planes with their speed soon proved that they could reach any point in the country in short time.

With new buildings and equipment must necessarily come a larger force of pilots and ships. They have been adding regularly, and lately Major Lanphier has been leading 27 fighting planes, 24 pursuit and one Douglas transport with his DHs as protection in full battle formation and practice.

Equipment for night flying is now at the field, including boundary lights and a large flood lamp, and night practice will start upon installation of lamps.

More transport planes are to be added to the regular service, as well as a number of training planes which are to be used for special work for 300 reserve officers assigned to Selfridge Field for this summer. Considerable cross-country flying is planned.



Plenty of room in this hangar

—*made entirely of STEEL*

For individual hangar or large hangars for airports, the type of building shown above proves advantageous.

The Butler *Ready-Made* Steel Hangar is noncombustible because it is made entirely of steel. The wall and roof sheets are 24 gage and have deeply drawn paneled corrugations.

Plenty of light, too

The lighting facilities are very good. Note that there are windows not only on the sides but also in the monitor above. This is a desirable feature when working on machines.

Wall and roof sheets are bolted together and to the steel frame by means of galvanized stove bolts. This provides a secure fastening for the sheets and avoids the noise of a loose rattling sheet. In addition, the tight fit of the bolted sheets makes our unlined Butler Buildings practically as tight as a lined building where wall and roof sheets are fastened together by nails bent around purlins and girts.

Because of its bolted construction, Butler Buildings may be taken down, moved and reerected with practically 100% salvage.

Send for prices

It will pay you to get full information on Butler Steel Buildings. Write for complete details today.

TRADE
STEEL
BUTLER
PRODUCTS
MARK

Butler Manufacturing Company

Kansas City, Mo. Minneapolis, Minn.
Foreign Department: KANSAS CITY, MO.

ARMY AND NAVY AIR SERVICE ORDERS

ARMY AIR CORPS ORDERS

THE following Army Air Corps orders have been issued as of the dates indicated in brackets:

Andrews, Capt. Albert E., from Brooks Field, Tex., to Fort Sam Houston, Texas. (Mar. 23)
Bailey, 1st Lt. Joseph P., leave of absence 2 months. (Mar. 2)
Bridgeman, 2d Lt. Richard H., Cav., relieved from detail in Air Corp., and will proceed from Fort Houston, Tex., for Fort Meade, S. D. (Mar. 12)
Calhoun, 1st Lt. Milo C., from Brooks Field, Tex., to Fort Sill, Okla. (Mar. 16)
Chandler, 1st Lt. Homer G., from Brooks Field, Tex., to March Field, Calif. (Mar. 16)
Conrad, 1st Lt. Glenn Virgil, from Washington, D. C., to Langley Field, Va., for duty. (Mar. 3)
Dunn, 1st Lt. Ray A., relieved from Walter Reed General Hospital and will rejoin station at Fairfield, Ohio. (Mar. 2)
Easterbrook, Capt. Arthur E., from instructor, Washington National Guard, Spokane, Wash., to Kelly Field, Texas, for duty with Air Corps Advanced Flying School. (Feb. 25)
Flickinger, Capt. Harrison W., relieved from additional duty as constructing quartermaster, Middletown air intermediate depot, Middletown, Pa. (Feb. 26)
Galloway, Capt. Floyd E., from Langley Field, Va. to Chanute Field, Rantoul, Ill. (Mar. 11)
Goodsell, 1st Lt. Ogden Maxwell, Reserve, Grand Rapids, Mich., to Selfridge Field, Mich., for detail with First Pursuit Group. (Feb. 25)
Griffith, 2d Lt. John S., promoted to 1st Lt. (Mar. 21)
Kincaid, 1st Lt. Alvin C., from Kelly Field, Tex., to March Field, Calif. (Mar. 16)
Hall, Col. Chalmers G., from corps area headquarters Sixth Corps Area, Chicago, Ill., to Army War College. (Mar. 5). Placed on the detached officers' list, to take effect upon his arrival at Washington Barracks, D. C. (Mar. 14)
Haynes, 1st Lt. Caleb V., from Crissy Field, Calif., to detail as instructor Washington National Guard, Spokane, Wash., following 10 days' temporary duty at Ninth Corps Area headquarters, San Francisco, Calif. (Feb. 25)
Hickam, Maj. Horace M., from command and Gen. Staff School, Fort Leavenworth, Kansas, to Army War College. (Mar. 5)
Hofstetter, Capt. Clarence F., Ordnance Dept., to duty involving flying for purpose of inspecting, testing or studying operation of armament for aircraft. (Mar. 4)
Lovell, Maj. George E., Jr., from Bolling Field, D. C., to Rome, Italy, for duty as military attaché at American embassy. (Mar. 2)
Martin, Maj. Frederick L., from Bolling Field, D. C., to Washington, D. C. (Mar. 16)
McIntosh, Maj. Lawrence W., from office of the Chief of Air Corps. Washington, D. C., to Army War College. (Mar. 5). Placed on the detached officers' list to take effect upon his arrival at Washington Barracks, D. C. (Mar. 14)
Quinn, Capt. Orlo H., from duty in office of Chief of Air Corps, Washington, D. C., to Kelly Field, Tex. (Mar. 2)
Scanlon, Maj. Martin F., from duty as military attaché, American Embassy, Rome, Italy, to Langley Field, Va., for training in Air Corps Tactical School. (Mar. 2)
Strong, 1st Lt. Earle Roberts, from Washington, D. C., to office of Assistant Secretary of War for training in procurement activities. (Feb. 28)
Toftoy, Lt. Holger N., to Coast Artillery Corps and he will proceed from Fort Sam Houston, Tex., to Hawaiian Dept. (Mar. 17)
Tonkin, 1st Lt. Earle H., from McCook Field, Dayton, Ohio, to March Field, Riverside, Calif. (Feb. 28)
Walker, 1st Lt. Ralph B., to March Field, Calif. (Mar.16)
Wash, Maj. Carlyle H., from Kelly Field, Tex., to March Field, Riverside, Calif. (Mar. 4)
Wriston, 1st Lt. Roscoe C., leave of absence 3 months, 15 days. (Mar. 14)
Simon, 1st Lt., C., Jr., to Army retiring board, Washington, D. C., for examination. (Mar. 15)

KELLY FIELD GRADUATES

THIRTY-FIVE students consisting of five officers of the Regular Army, all of whom have been assigned to Kelly Field for duty, two naval officers, and 24 flying cadets, graduated as qualified airplane pilots from the Advanced Flying School at Kelly Field, San Antonio, Texas, on February 28.

The *Regular Army* officers completing this course of training are 1st Lt. Joseph P. Bailey and 2d Lts. Howard E. Engler, Wilfred H. Hardy, Joseph L. Loutzenheiser, all Cav., and David M. Ramsay.

The *flying cadets* who qualified as airplane pilots are George R. Acheson, John C. Berry, Robert E. Coulter, Lee F. Duncan, Wilbur Erickson, George R. Geer, Reginald Heher, Clarence W. Hudson, Ford L. Lauer, Daniel F. Lindsay, George H. MacNair, Forrest L. Neville, Charles B. Overacker, Rudd J. Peaslee, Hansford W. Pennington, Leroy H. Prindle, Herbert E. Rice, Fred G. Richardson, Frank H. Robinson, Gordon P. Saville, Robert L. Schoenlein, Allen R. Springer, Herbert V. Vanatta, and James F. Walsh. The two Navy officers qualifying as airplane pilots were Lts. Wallace M. Dillon and Mathias B. Gardner.

All of the graduated flying cadets were recommended for commissions as second lieutenants in the Air Corps Reserves, and nine of them were immediately ordered to active duty as flying cadets for a period of two years. The nine ordered to active duty and the stations to which they have been assigned are: Flying Cadets Acheson and MacNair to Fort Crockett, Texas; Hudson, Overacker, Prindle, Robinson, and Saville to Mitchel Field, Long Island, N. Y., and Neville and Springer to Langley Field, Va.

In addition to the above, 16 officers of the Air Corps of the regular establishment and one Cuban cadet completed a three months' non-flying observation course at the Advanced Flying School, and they have been sent to various stations in the United States. They are Lt. Col. Harry Graham, Majs. James A. Mars and Harrison H. C. Richards, Capts. Oliver S. Farson, William B. Mayer, and Julian F. Wheeler, 1st Lts. Benjamin B. Cassiday, William B. Clarke, Bushrod Hoppin, Clarence F. Horton, Lawrence A. Lawson, Clarence B. Laber, John M. McCullough, Walter J. Reed, and Lewis R. P. Reese, and 2d Lt. Reginald R. Gillespie. Cadet Hari Cruz, Cuban cadet, was the only member of a foreign army to complete this non-flying observation course.

CAPT. USHER LEAVES FOR THE PHILIPPINES

CAPT. GEORGE L. USHER, for the past six years instructor for the New York National Guard Air Corps at Miller Field, Staten Island, received a send-off in the form of a seven-plane formation when he left on March 24th for the Philippines from the army base, Brooklyn, aboard the *Somme*. The formation was led by Major George A. Vaughan, commanding officer of the Twenty-seventh Division Air Corps.

While en route and upon arrival in the Philippine Islands Capt. Usher will act as liaison officer for the Congressional Committee headed by Senator Burton Wheeler, which sailed aboard the *Somme*.

Capt. Usher has been replaced at Miller Field by Lieut. M. L. Elliott, former stunt pilot of Mitchel Field.

BROOKS FIELD GRADUATES

FORTY-THREE officers of the Regular Army, seven officers of the National Guard, fourteen reserve officers, twenty-eight flying cadets, one Cuban cadet, and three enlisted men of the Regular esatlishment, or a total of 96, completed on February 26 the regular prescribed course at the Air Corps Primary Flying School, Brooks Field, Texas. Certificates of graduation were given to the successful students completing this course of training, which began on September 15, 1926. Following is given the list of student officers completing this primary course:

Regular Army—Capt. Fabian L. Pratt, M. C.; 1st Lts. Ewart G. Plank, Augustine F. Shea, and Gervais W. Trichel, all Air Corps; 2d Lts. James W. Andrew, John W. Bowman (Cav.), Glen O. Barcus, Henry R. Baxter, Thurston H. Baxter, Harvey L. Boyden (Cav.), James B. Burwell, William M. Creasy, jr., Demus T. Craw (Inf.), Oscar F. Carlson, Ward J. Davies, Donald Dunford (Inf.), George J. Eppright, Richard H. Gilley, Henry L. Hughes, William I. Howarth, Samuel R. Harris, jr., Frank G. Irvin (Inf.), Alfred H. Johnson, Reuben Kyle, Harry C. Lichtenberger, Gregg N. Lindsay, Edmund C. Lynch, Robert R. Martin (Inf.), Charles W. McGeehan, Marvin J. McKinney, Morris R. Nelson, Paul B. Nelson, Raymond D. Palmer, James G. Pratt (Cav.), Shelton E. Prudhomme, Edward B. Raney, Harry M. Roper (F. A.), Josiah Ross, Charles A. Ross, Turner A. Sims, Manning E. Tillery, Clarence D. Wheeler, and John P. Woodbridge.

The *National Guard* officers completing this course, all second lieutenants, are William K. Ennis and Homer L. Sanders, Texas, Francis D. Graham, Missouri, James H. McKenney, Michigan, Francis M. S. Miller, California, Louis T. Reichers, New York, and Ferman A. Stone, Alabama, while the *Reserve officers* completing this primary training, all of whom are air corps reserve officers, are: 1st Lt. William S. Johnston and 2d Lts. Edward H. Alexander, Kenneth K. Ayer, Robert H. Berg, Allen A. Barrie, Marvin V. Harlow, John A. Kerr, Albert E. Merrill, Russell E. Robertson, James A. Riviere, Frank B. Stuart, Carl F. Theisen, William H. Taylor, and Ernest K. Warburton.

Flying cadets—John Z. Adams, Jack A. Bird, Byron A. Bunch, William B. Blaufuss, Lester W. Bryant, Harold F. Brown, Joseph A. Bissell, Byron S. Cooper, Reginald J. Elmore, Malcolm M. Cloukey, Luther E. Dooley, Harry W. Generous, Donald F. Gayer, Robert D. Johnston, Henry C. Kristofferson, Harry C. Lewis, Fred M. Lanter, Lester Munger, George B. Manning, George A. Malkmus, Frank L. Nelson, Clement K. Phillips, Ransom C. Reed, Elmer P. Rose, Harold C. Robinson, John S. Snyder, William L. Woodruff, and James C. Youngblood. The Cuban flying cadet was Rogelio L. Morlote, while the three enlisted men completing the primary course are Mstr. Sgt. Bernard Wallace, Tech. Sgt. Robert E. L. Choate, and Staff Sgt. Samuel J. Samson.

Six officers of other branches of the Army were recently detailed to the air corps and ordered to undergo training at the primary flying school, Brooks Field. They are: Capt. Roy E. Craig and 2d Lt. Harold E. Walker, (Cav.), Lt. Col. Walter Krueger and 1st Lt. Terrence J. Tully (Inf.); Capt. John A. Wheeler, O. D., and 1st Lt. Francis H. Kuhn (Q. M. C.)

NAVY AIR SERVICE ORDERS

THE following Navy air orders have been issued as of the dates indicated in brackets:

Bartlett, Lt. Comdr. Harold T., detached VS Sqdn. 2, Aircraft Sqdns., Battle Fleet, to *U.S.S. Langley*. (Feb. 24)
Carter, Comdr. Worrall R., detached Office Naval Intelligence, to temporary duty Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Feb. 14)
Cohan, Lt. (j.g.) Angus M., detached Nav. Air Sta., Pensacola, Fla., to *U.S.S. James K. Paulding*. (Feb. 24)
Conway, Lt. Edwin F., detached Navy Yard, Washington, D. C., to c.f.o. *U.S.S. Saratoga*. (Mar. 18)
Crow, Ens. Edward F., detached Nav. Air Sta., Pensacola, Fla., to *U.S.S. Niagara*. (Feb. 17)
Dennett, Lt. Comdr. Ralph E., detached Nav. Air Sta., Pensacola, Fla., to *U.S.S. Utah*. (Mar. 3)
Dussault, Lt. (j.g.) George A., detached VO Sqdn. 1, *U.S.S. West Virginia*, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Hampton Roads, Va. (Feb. 14)
Ellis, Ens. Norman W., orders January 29, 1927, modified; to duty VO Sqdn. 1, Aircraft Sqdns., Battle Flt. *U.S.S. Colorado*. (Feb. 21)
Esau, 1st Lt. G., detached M. B., N. A. S., San Diego, Calif. to M. C. B., N. O. B., San Diego, Calif. (Mar. 8)
Fahrney, Lt. Delmar S., detached VO Sqdn. 1, *U.S.S. West Virginia*, Aircraft Sqdns., Battle Fleet, to Nav. Air Sta., Pearl Harbor, T. H. (Feb. 17)
Fellers, Lt. William M., to duty Bureau of Aeron. (Mar. 2)
Harrison, Lt. Comdr. Homer H., detached Naval Aircraft Factory, Navy Yard, Philadelphia, Pa., to Nav. Air Sta., Lakehurst, N. J. (Mar. 18)
Hunter, Lt. DeWitt T. (M.C.), to duty Aircraft Sqdns., West Coast Expeditionary Force, U. S. Marine Corps. (Feb. 24)
Leith, Lt. (j.g.) Stanley, detached Nav. Air Sta., Pensacola, Fla., to *U.S.S. Decatur*. (Feb. 24)
McCandless, Comdr. Byron, detached Nav. Air Sta., Pensacola, Fla., to Third Nav. Dist. (Feb. 24)
McWhorter, Comdr. Charles S., detached Nav. Air Sta., Pensacola, Fla., to Third Nav. Dist. (Feb. 24)
Peck, Lt. (j.g.) Edwin R., detached VO. Sqdn., *U.S.S. Nevada*, Aircraft Sqdns., Battle Flt., to Nav. Air Sta., Hampton Roads, Va. (Feb. 24)
Pixton, Lt. (j.g) John E., to duty VO Sqdn. 2, Aircraft Sqdns., Battle Flt., *U.S.S. Idaho*. (Mar. 18)
Richardson, Lt. Jack C., detached Nav. Air Sta., Lakehurst, N. J., to *U.S.S. Los Angeles*. (Mar. 1)
Ridgely, Lt. Comdr. Conrad, detached Dist. Commun. Officer, Boston, Mass., to c.f.o. *U.S.S. Lexington*. (Mar. 18)
Rodner, Ch. Pay to Clk. Henry F., detached *U.S.S. Texas* to Nav. Air Sta., Anacostia, D. C. (Mar. 19)
Rorschach, Lt. Frank, Jr., detached Navy Yard, Washington, D. C., to c.f.o. *U.S.S. Lexington*. (Mar. 18)
Sallada, Lt. Harold B., detached Inspr. of Naval Aircraft, Buffalo, N. Y., to Naval War College, Newport, R. I. (Feb. 21)
Schmidt, Lt. Karl (C.C.) orders February 21, 1927, to Nav. Aircraft Factory, Navy Yard, Philadelphia, Pa., revoked; detached Nav. Aircraft Factory, Navy Yard, Philadelphia, Pa. (Mar. 3)
Sheehan, Lt. John M., to duty Bureau of Aeron. (Mar. 2)
Stonestreet, Lt. Martin B., detached Nav. Air Sta., Coco Solo, C.A., to VS Sqdn. 2, Aircraft Sqdns., Battle Fleet. (Feb. 21)
Tisdale, Lt. Comdr. Ryland D., detached Bu. Eng., to c.f.o. *U.S.S. Lexington*. (Mar. 18)
Tyler, Lt. Grandison T. (SC.), detached Rec. Brks., Hampton Roads, Va., to Nav. Air Sta., Nav. Oper. Base, Hampton Roads, Va. (Mar. 1)
Vincent, Ch. Pay Clk., Theodore J., detached Scouting Fleet, to Nav. Air Sta., Anacostia. D. C. (Mar. 19)

Staunch!

Consolidated Husky

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BUFFALO - N.Y.

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By Colonel W. Jefferson Davis

Former War Department Legal Advisor in Europe, Member Aviation Committee American Bar Association, Executive Committee Comite Juridique Internationale de l' Aviation.

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THE AERONAUTICAL INDUSTRY

COMDR. BYRD'S PLANS

"WE want to set right one thing. If we attempt a transatlantic flight it will not be for the Orteig or any other prize that is being offered. We will not even send our names to the contest committee. We do not mean to make any hint or criticism of anyone who tries for any prize. Floyd Bennett and I do not believe in talking about what we are going to do until we have collected all our facts upon which to base our plans. I want to say with emphasis that we feel that aviation has been hurt by premature announcements of flights and plans that are never carried out. Our desire is to help the progress of aviation as we do not wish to defeat our object at the outset by statements of what we are going to do that are based largely on theory. We do not believe in that and I know that the newspapers are sympathetic with us in this thought.

"I have just finished a tour of the whole country and naturally I met the aviation enthusiasts and everywhere I found the newspapers backing aviation unselfishly, and that newspaper backing is the biggest thing today in aviation progress and aviation is the biggest thing today on the business horizon.

"There has been formed in America the America Trans Oceanic Company, Inc. This company is having built by the Atlantic Aircraft Corporation a plane that will be named 'America.'

"We have not decided definitely how, where, or when we will attempt to cross the Atlantic with this plane. We wish to do more planning to get more facts.

"Rodman Wanamaker was the first man to propose a transatlantic flight from the United States to Europe, and before the war built a great plane, the 'America', for this purpose. The World War necessarily deferred his plans.

"Mr. Wanamaker is simply trying to assist aviation progress and is even more anxious than we are to dissociate our proposed effort from any commercial aspect and so we will avoid advertising any particular organization or any commercial product.

"The Navy coöperated to the extent of giving leaves of absence to Bennett and myself and if we attempt the flight will also assist with the hydrography, navigational and meteorological matter. It is expected that the United States Weather Bureau will assist with the collection of meteorological data." *Richard E. Byrd, Commander, U.S.N.*

P. & A. Photos.

Commander Richard E. Byrd.

LANSING AIR NEWS

By G. W. Hawkins

WITH the coming of the Driggs Aircraft Corporation, manufacturers of light planes, to the city, interest in aeronautics has assumed a rapid stride.

Plans for a Central Michigan Air Meet which will eclipse anything of its kind ever held in the state, are rapidly taking form and will be announced at the spring meeting of the Michigan Aircrafters' Association which will be held in Battle Creek within a few weeks, according to C. C. Bryant, secretary of the organization.

Two years ago, a school of aviation was inaugurated and the board of education coöperated in offering not only the use of a room at the central high school but part of a credit for students attending the aviation classes with a certain percentage of punctuality. In favorable weather, the classes are held at the field near the city where the students are given ground instruction and fundamentals. The school has grown from a few interested youths to a group which now includes many of the older enthusiasts as well and threatens to outgrow the capacity of the room in which the classes are held.

Official U. S. Army Air Corps motion pictures are shown during class hour and talks are given by local pilots and other instructors who are devoting their time and money in furthering the interests of the science.

The latest step in creating further interest in aeronautics was the inauguration recently of a series of radio talks over WREO, broadcasting station of the Reo Motor Car Company of Lansing. The talks are given twice weekly, Tuesday and Thursday evenings, and have proven exceptionally interesting as well as popular with aviation fans.

INDIANAPOLIS AIRPORT

THE Indianapolis airport—Cox Field—lies four and a half miles to the southwest from the Soldiers and Sailors monument which is the pivot point of the city. It is being developed on a sound basis by the Indianapolis Airport Corporation, an outgrowth of the Chamber of Commerce movement to provide full aviation facilities for the Hoosier capital.

The field is composed of 234 acres, leased by the corporation, of which 130 acres are being used extensively. Ideal accommodations are offered, the landing area (2,000 yards east and west by 3,000 yards north and south) being level, drained and smooth. First aid station, telephone, city gas, city water and plane fuel are at hand. There is an operators' office as well as two hangars for planes of the 113th National Guard Observation Squadron.

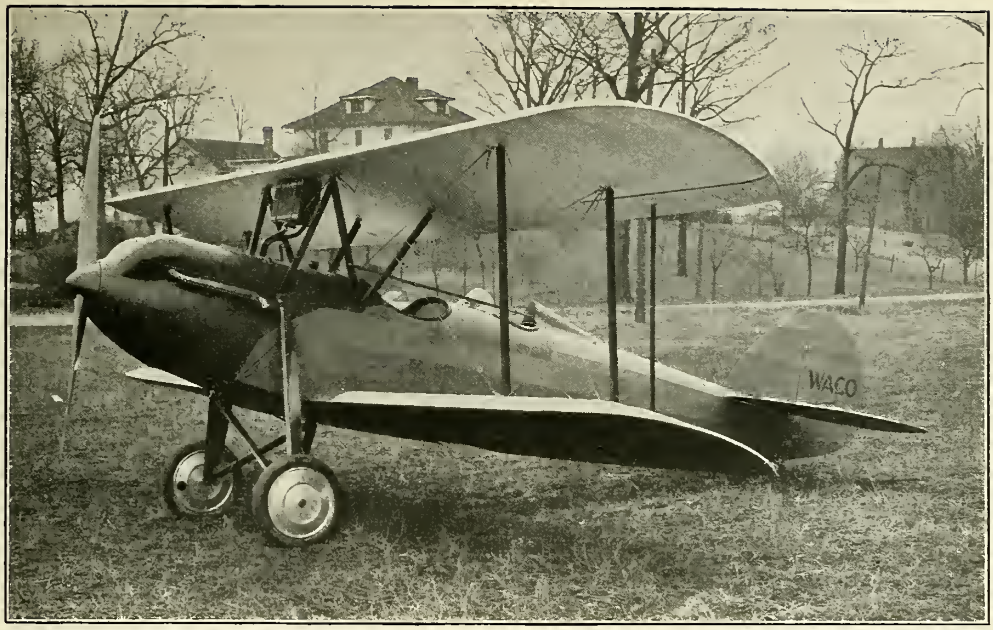
Paul H. Moore, secretary of the airport organization, indicates plans are going forward for night lighting equipment and for complete provisions to handle commercial craft. The city is situated in such a position that it is expected to play an important part in central midwestern flying. Other members of the board besides Mr. Moore, are: J. A. Goodman, president; Robert Bryson, vice-president; Felix McQuirter, treasurer; Nicholas Noyes, Elmer Stout, Frank E. Gates, and Samuel Ashby.

The field was named in honor of Linton A. Cox, Jr., an Indianapolis man who served with Eddie Rickenbacker and Quentin Roosevelt during the war. Cox was active in promotion of aviation and was killed in an automobile accident while on the way with a group of friends to attend the 1924 national air races at Dayton, Ohio.

LICENSE APPLICATION TIME LIMIT EXTENDED

BY the terms of Special Order No. 3, signed February 26, 1927, the time limit for the submitting of applications for licenses and identification marks has been extended by the Department of Commerce, Aeronautics Branch, from March 1, 1927, until May 1, 1927, because, apparently, some of the pilots, mechanics and operators affected by the regulations do not completely understand the provisions of the law. To date there has been a flood of applications covering airmen and aircraft, but on account of the short time remaining before the date first named in the Savings Clause, it was decided to give a reasonable extension.

After May 1, 1927, any pilot, operator, or mechanic, who has not applied for the necessary license or identification mark, or both, will be subject to penalty of $500. The Department is seriously considering infliction of such penalty upon those who, at that time, have apparently made no effort to comply with the regulations.



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DOES IT PERFORM LIKE
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LANDING GEAR—Wide tread split type without exposed super structure—Hydraulic Shock Absorbing eliminating all rebound—THE STUDENT PILOTS DISGUISE.

STRUCTURAL STRENGTH in excess of requirements for Class 1 U.S. Air Commerce Regulations. Designed for and available powered with OX5 - OXX6 - Hisso or Whirlwind motors—SAFETY.

This every-day comparison with the accepted standard we answer with pleasure. This New Deluxe Model Ten WACO with its

QUICKER TAKE-OFF
FASTER CLIMB
HIGHER TOP SPEED

than even the WACO Nine is a plane—full of safety, comfort and utility features—a worth waiting for surprise that very ably asserts WACO'S proverbial leadership in value and performance.

New Fans let your air-wise Friend explain the Student Value and Student Safety of Waco Ten Features and Waco's unequalled Performance. He knows the advantages of an all-altitude Airplane of proven Superior Performance. Ask him. Judge for yourself the Beauty, Refinement, Quality and Finish of the New Waco Ten.

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The ADVANCE AIRCRAFT
COMPANY
TROY, OHIO U. S. A.

UNSEEN AND UNHEARD

IN aerial photography, as in any other line of business, supply, both in kind and in volume, is controlled by demand. And if the present day demand seems to lie at least partly in the direction of greater personal comfort and efficiency for the surveyor and the public, the aerial photographer may consider the situation something of a compliment to himself. Presumably he has gained a lap in the race and now he may catch his breath. As a matter of fact, however, he isn't resting. Eternal vigilance, he knows, is the price of progress; and he's busy.

He's busy, specifically, at the task of fitting the aerial camera more accurately to the present day needs. Aerial photography is increasing in volume; the demands made upon it are becoming more stringent. The situation demands—and the future will continue to demand—aerial maps that are accurate and to scale, maps that may be enlarged several diameters without perceptible loss of detail. The engineer demands—and will continue to demand—an aerial camera that will be absolutely automatic, a camera that will "handle" easily, a camera whose operation insures a maximum of safety and a minimum of muscular and mental effort.

And so the aerial camera manufacturer, to whom demand always stands as a challenge, is busy. He's busy in many different directions and at many spots in the camera's anatomy. He's busy with old problems and with new ones.

The outstanding accomplishment in aerial photographic picture makers is the Fairchild Automatic Recording Camera. Used as standard equipment by the U. S. Air Services, the Royal Canadian Air Force and numerous foreign governments, this camera is almost human in its action, and does what no other camera can do at this time.

On a strip of 75 feet of film it will take 115 consecutive exposures, 7 x 9 inches in size, and all the pilot has to do is to set the Intervalometer on his instrument board in the plane, and the camera does the rest. In other words, no additional observer-photographer is needed and, in addition to the aerial picture under observation, complete engineering data, such as the time of the exposure, the focal length of the lens, the serial number of the camera, number of exposures, the altitude and level of the camera and any written notes, the pilot may add, are permanently and accurately recorded.

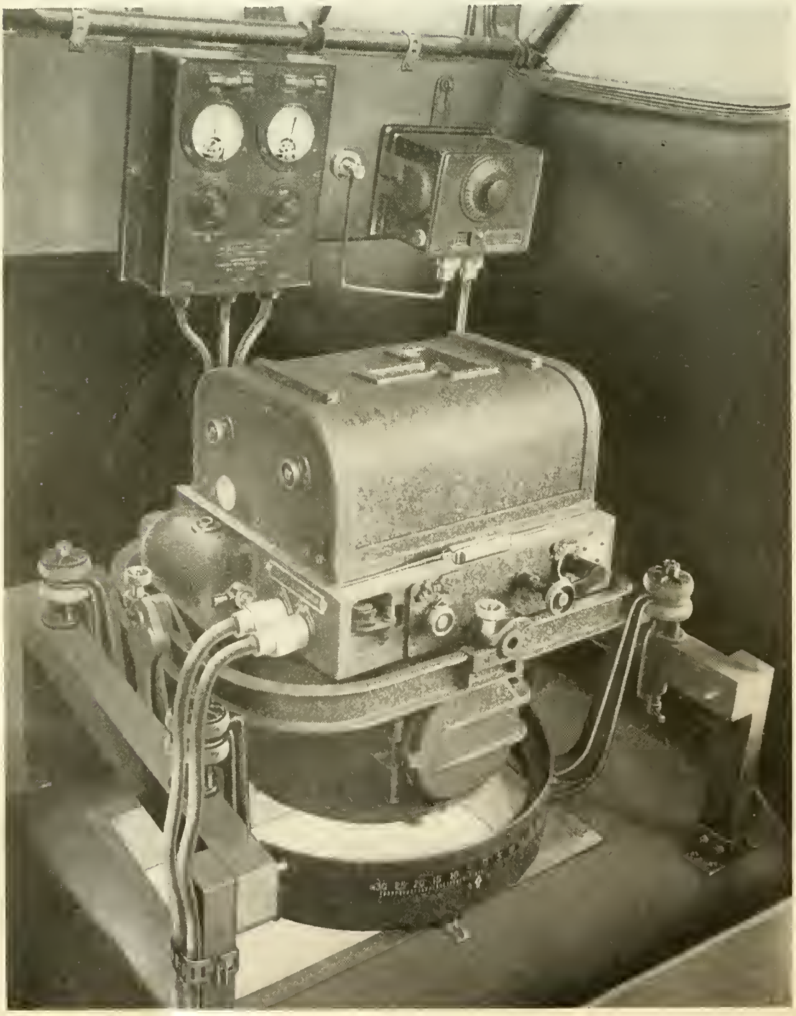
In this manner the element of human errors has been completely eliminated. Extra film magazines may be slipped in position in less than 5 seconds and twice the area may now be mapped without stopping the camera mechanism. With one single loading an area of 180 square miles may be accurately mapped from a height of 10,000 feet.

The "between-the-lens" shutter, in addition to perfect light distribution over the entire film face, assures greater speeds, and is absolutely unaffected from the vicissitudes of climatic extremes.

It is significant that two U. S. Army Aviators, not so long ago, established a photographic altitude record by ascending to 32,200 feet, and taking a photograph of the city of Dayton, Ohio, from a height of six miles, covering an area of 19 square miles in a single exposure, 7 by 9 inches.

The ultimate possibilities of photographic apparatus, for the mapping of the ground beneath from such altitudes, with the plane —unseen and unheard—haven't even been fully realized. The importance of scientific aerial photography for martial and commercial pursuits will constantly increase, as time goes on, and more rigorous demands are made upon creative genius to supply that demand.

At this stage the future scope of aerial photography cannot even be forecast with any degree of accuracy. Time alone will tell.



The Fairchild Automatic Recording Camera, used by the U. S. Air Services.

YALE AERO CLUB

YALE UNIVERSITY has entered the field of aviation, through the organization of the Yale Aero Club, which has been formed through the efforts of president Henderson Emmanuel and is backed by over thirty-five members of the University, as well as those outside who have felt the need for such organizations in the colleges.

The club is composed of men interested in almost all the different aspects of aviation. It is felt that one of the most important functions of a college club of this type is to allow these men to work in whichever field they are interested and to provide instruction to those who desire it.

A course, to be started immediately, in aerodynamics and engine design was outlined by Professor F. Kimball, of the Yale Department of Mechanical Engineering, at the second meeting. This course will be conducted through regular weekly classes under the direction of men especially prepared in the various fields.

Jack Tweed, president of the New Haven Air Terminal, has offered members the use of his seaplanes, shops and instruction. A ground school course is being held regularly at the University, and this in connection with the practical work under Jack Tweed offers the members a chance to learn the real dope on flying.

The club is interested in receiving suggestions and information from those directly connected with aviation, and invites all to visit the club. Clubs of other colleges are invited to correspond, and may do so by addressing: N. L. Engelhardt, Jr., 119 College Street, New Haven, Conn.

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Havelock, Nebr.

The Arrow Aircraft Corporation offers three distinctive models in aircraft, namely —The Arrow Sport—The Arrow Five—and The Arrow Six—all of which are leaders in their fields.

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The Arrow Sport

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HONEST VALUES IN AIRCRAFT

LIGHTHOUSE BUREAU TO CARE FOR AIRWAYS

THE Airways Division, under the Assistant Secretary of Commerce for Aeronautics, is now a part of the Lighthouse Service, and under the terms of the Air Commerce Act it is spending the largest proportion of the funds made available for the promotion of commercial aviation. Its duties include examination of the airways, selection of emergency landing fields and beacon sites, erection of structures, and installation and maintenance of aids to aerial navigation.

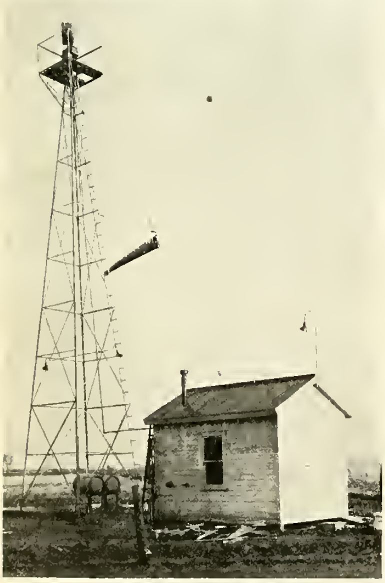
The airways to be established during the fiscal year 1927 are primarily those required by the air transport companies engaged in carrying mail under contract with the Post Office Department.

There are 9,475 miles of airways now in operation or proposed for the near future, of which 2,041 miles of the transcontinental airway are already lighted. Over 1,100 miles of additional lighted airways will be established during the calendar year 1926. On the airways between airports revolving searchlight beacons are established approximately 10 miles apart, and emergency landing fields are 40 to 50 acres in extent, having suitable runways of not less than 1,500 feet in length for the landing of aircraft.

The fields are lighted by boundary lights spaced approximately 300 feet apart, showing the outline of the field from the air. A cable is carried around the field furnishing electric current to the 15-watt lamps in the boundary standards. Red lights are mounted on all obstructions and green lights are used to show the best approach to the field. An internally lighted wind cone mounted on the airway beacon structure shows the direction and velocity of the wind.

The airway beacon consists of a 24-inch revolving searchlight with 1,000-watt lamp, showing candlepower of approximately 2,000,000, with a flash every 10 seconds. The searchlight beacons are mounted on 50-foot skeleton windmill type towers and are automatic in operation by the use of a sun relay, where commercial power is available. Otherwise, farm lighting sets are used for generating electric current. The day-mark consists of a concrete arrow 56 feet long.

Each airway route carries a number which is painted conspicuously on one side of the gable roof of power-house buildings. Each beacon is numbered consecutively, and the designated number is likewise painted to show from the air for the identification of the structure. Part-time caretakers are employed locally to operate the engine generating sets and for the maintenance of emergency fields.



Steel tower with revolving Sperry beacon.

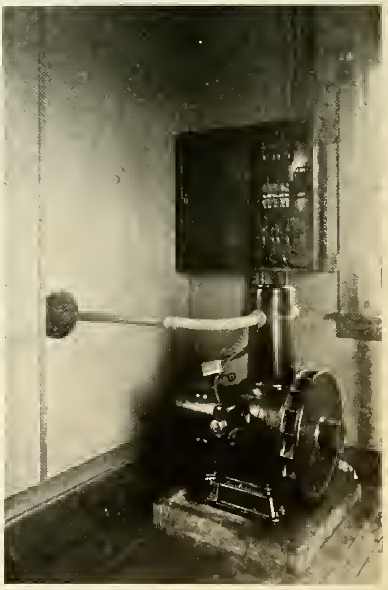
LIGHT PLANTS FOR AIR MAIL FIELDS

IN the establishment of the United States Government Air Mail Service night flying is one of the important factors and one that has probably presented the most difficulties. Upon the success of this factor depends to a great extent the success or failure of air mail service, and in turn, the safety and feasibility of this night flying is dependent upon the ability to provide suitable airways, efficient illumination at the many landing and airway beacons. On airway routes 1, 2 and 3, installation of Westinghouse type E-86 light and power plants is now in progress.

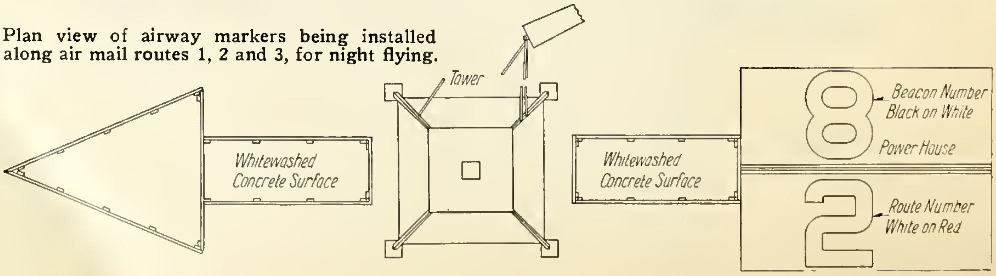
The revolving searchlight beacons on the airways are spaced approximately 7 to 13 miles apart and emergency landing fields are provided at 30 mile intervals. The landing fields will be approximately 40 acres in size with 1,500 ft. runways, and are identified by the searchlight beacon and boundary lighting showing the outline of the field. Each airway beacon has a directional arrow, consisting of a power house, concrete walks and tower forming an arrow pointed along the airway. The power house will be located at the feather end of the arrow, and will be approximately 12 ft. by 14 ft. The light plant will be located in this house. It is of Westinghouse manufacture standard make, non-battery type, for 110-volt service, with a capacity of 2,000 watts. It is easily started by hand cranking, and will supply the power for the entire lighting at the airway beacons and emergency landing fields. A 500-gallon fuel tank is placed underground in the rear of the house to provide storage over long periods of time. The house itself will be lighted inside with a 75-watt lamp.

The roof of the house will be of a gable shape and will be painted white on the right side of the ridge, and a bright non fading red on the left side of the ridge. A number corresponding with the route number will be painted white on the red and a number corresponding with the beacon number shall be painted black on the white. The numbers will be 6 feet high, 4 ft. wide, with lines 12 inches wide.

The skeleton tower is 50 ft. high, surmounted by a 24 inch Sperry revolving beacon driven by a 1-6 h.p. motor, and so arranged that a powerful searchlight beam is directed slightly above the horizon. The concrete directional arrow is lighted by means of 100-watt lamps and reflectors, located on the tower at a height of 21 feet, illuminating the route number and beacon number for identification from the air.



Westinghouse 2000 watt lighting plant.



Plan view of airway markers being installed along air mail routes 1, 2 and 3, for night flying.

Tower
Whitewashed Concrete Surface
Whitewashed Concrete Surface
8
Beacon Number Black on White
Power House
2
Route Number White on Red

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The New Hess "Blue Bird"

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The unusual strength
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Combined with

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FLYING TESTS OF THE JOHNSON TWIN-60

THE new Johnson Twin-60 has been demonstrated before Orville Wright, Assistant Secretary of War, Mr. Davidson, and the Assistant Secretary of the Navy, Mr. Warner, Brig. General Gilmore, W. B. Mayo and W. B. Stout of the Ford Company, who flew to Dayton to see the Twin-60, Sherman M. Fairchild and many others prominent in the aeronautical world. All who have seen it fly or have flown it have expressed their commendation over its performance and appearance.

Walter Brookins, a real old timer who flew one of the first Wright planes and held world records for altitude in the past, flew the Twin-60 after an absence of twelve years from the cockpit of an airplane. He flew one of the ships equipped with a winter inclosure for work in Canada.

F. B. Patterson, president of the National Cash Register Company, flew a Twin-60 over his plant.

Students at the Johnson Flying School have flown it; some who have not as yet had their solo flights have landed the Twin-60. Ships are being delivered to men who have never flown before.

The production models are being equipped with more powerful engines, resulting in an increase of 25 per cent in useful power, and the weight is reduced over the experimental model previously announced in AERO DIGEST.

Mr. E. A. Johnson, president of the Johnson Aircraft Corporation, has just returned from Europe where a study of available engines for the Twin-60 was made. During his visit a constant supply of engines and spare parts for the new Twin-60 machines was arranged for. The new engines are more powerful, and their slower speed permits longer life and higher propeller efficiencies.

The new Twin-60's are being used with great success for photography. Motion pictures have been made from 200 to 500 feet altitude.

The Twin-60 climbs to 10,000 feet in 41 minutes, and has an absolute ceiling of 11,800 feet. It takes off in from 50 to 75 feet or 2½ to 5 seconds. It lands at a speed you are accustomed to driving an automobile, and rolls about 50 feet after landing without the use of brakes. Its landing and take-off characteristics are perhaps the most spectacular part of its performance.

To show what could be done with the Twin-60 in this respect, Clyde Emrick, Chief Test Pilot for the Johnson Companies, landed the ship in the Miami River bed, the river being at low state at the time. Rocks, debris of all kinds, holes, soft spots littered the ground and there was a high levee on one side and the river on the other to contend with. In spite of the adverse wind and ground conditions, the light weight, large wheels, ample control and the remarkable landing and take-off characteristics of the Johnson Twin-60 made the demonstration commonplace. Two or three bounces on the ground, a little aileron as the cross wind from the levee struck the ship, and that was all.

In a stall, the Twin-60 falls off on one wing and recovers itself, rather than indicating any tendency to spin. Its rolling characteristic is snappy with no wing flutter present and the ship under control at every point of the roll.

The Johnson Twin-60 after making a test landing on the Miami River bed.

BOY SCOUTS LEARN TO MAKE PLANE MODELS

A CLASS in elementary aeronautics with practical experience in the making of airplane models was organized by Schenectady Council of Boy Scouts. Ray Safford, an aviation enthusiast who has made a study of the subject, is the instructor. The class met for the first time last month at the scout workshop. Registrations are now being taken.

The course will be a thorough one. The introduction will treat of early experiments in aviation. Later lessons will deal with the classification of model airplane types, design and construction of a simple flying model and scale models, and instruction in model flying.

NAPIER LION DIRECT DRIVE AERO ENGINE

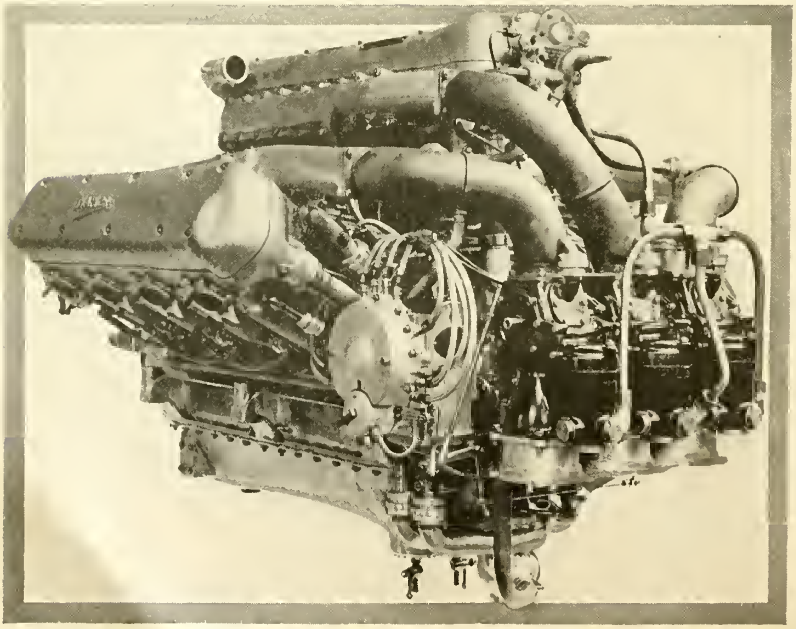
THE Napier Lion Series 8 direct drive aero engine is the latest product of the Napier Company. It embodies all the main characteristics of the geared Lion which has achieved such a remarkable reputation for reliability and efficiency, but it will be noticed that all accessories such as magnetos, carburetors, pumps, etc., are now located together at the rear end of the engine and the front end is much cleaner, helping considerably in obtaining efficient streamlining.

The weight of this engine is 915 lbs. approximately, and it is rated at 535 b.h.p. at a normal speed of 2,350 r.p.m. The engine gives a power of 570 b.h.p. at its maximum speed of 2,585 r.p.m.

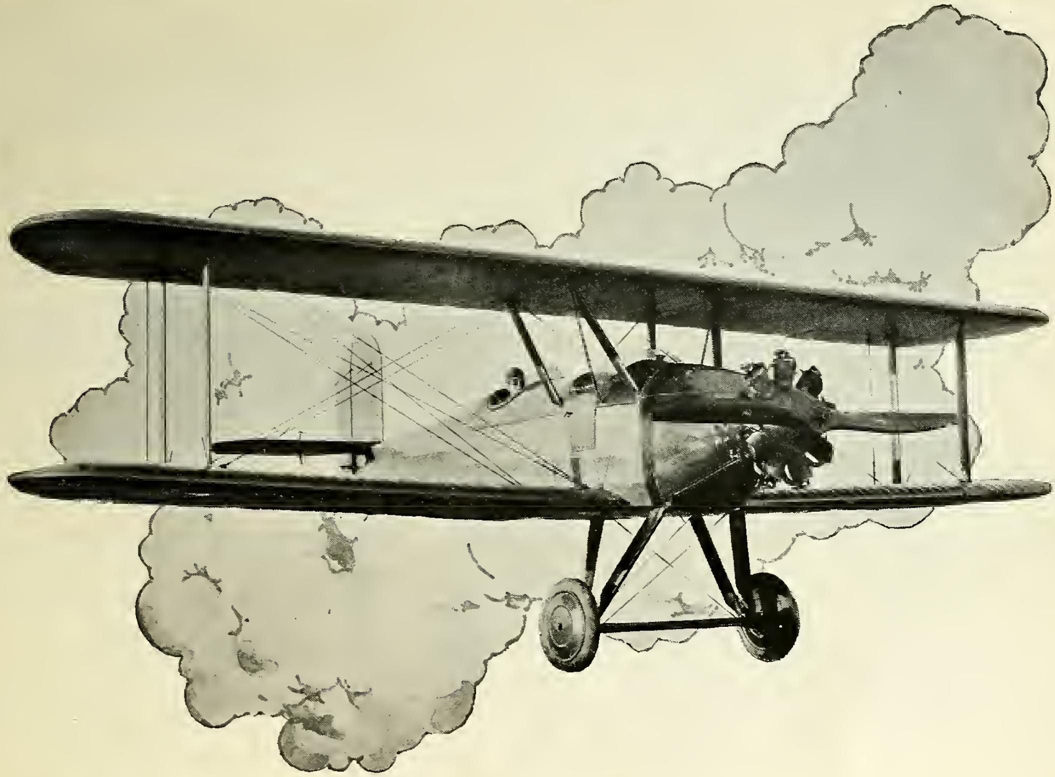
The weight of the engine is very low for the power developed and equals 1.71 lbs. per h.p. on the normal rating, and 1.6 lbs. per h.p. on the maximum output.

This latest type of Napier engine has recently passed the very strenuous type test of the British Air Ministry. This test of over 104 hours' duration consisted of ten 10 hour runs at nine-tenths of its rated power; that is, 483 b.h.p., followed by 1 hour at 535 b.h.p. and a full throttle run of 1 hour at 2,575 r.p.m. developing 569 b.h.p.

This direct drive model will be produced in addition to the famous geared Lion which is being manufactured in quantities for use in all parts of the world.



The latest product of the Napier Company, the 535-570 h.p. direct drive aero engine.



SPARTAN C-3

Commercial Three-Seater

FOR those who want SAFETY as the first requisite of an airplane and who also desire rugged endurance, reliability, comfort, beauty of design, economy of operation, low upkeep and efficient performance, we have made this airplane.

Its nonstalling characteristic under the most severe flight conditions, insures the safety of pilot and passengers, despite possible human errors in piloting.

Its performance sets a new mark in the three-seater class, and in attaining its high standard of comfort and beauty nothing has been sacrificed of structural strength or aerodynamic quality.

Designed and built in accordance with Department of Commerce Regulations for Class I Airplanes.

For details and dealer territory write

MID-CONTINENT AIRCRAFT COMPANY

TULSA, OKLAHOMA

FLORIDA AIR NEWS

By R. M. Decker

THE U. S. Coast Geodetic Survey is planning to make an aerial map of the east and west coasts of Florida. Lt. Guy Kirksey, U. S. Army Air Corps photographer, has been assigned the work.

Roger W. Babson, eminent statistician, through a pamphlet from the Babson Statistical organization, Babson Park, Mass., encourages municipal ownership of airports and gives his first official predictions regarding the future of the airplane industry. Information to this effect has been received by the airport Committee of the Miami Chamber of Commerce.

The committee, headed by Francis M. Miller, is drawing plans and concentrating interest towards the immediate acquisition of adequate landing facilities for land and sea planes in Miami.

In Mr. Babson's report he says: "So far we have refrained from making any general prediction regarding the airplane industry. The time has now come when advances in aviation will be much more rapid. Safer and better planes are being built and suitable landing fields and marked airways are being developed. The public is gradually becoming 'Air Wise.'

"Every city and town should immediately see to it that a suitable area, as centrally located as possible, is set aside for a future landing field before real estate values for property along the airways are advanced too greatly."

The following offer air service to Miamians and visitors:

The Rogers Air Lines, Inc., Biscayne Blvd., at Eighth St., flying boat service to Nassau and Cuba. Also sightseeing trips over Miami and Miami Beach. A school of instruction for flying boat work is also available.

The Chalk Flying Service and School of Aviation is located on the County Causeway. Seaplane service to the Florida Keys, and short flights over cities are available. A. B. Chalk is also distributor for duralumin pontoons and seaplanes.

The East Coast Aviation Camp, Hialeah. Waco airplanes distributors and flying instruction, also passenger service. Planes inbound for Miami use this airport at present, although within the limits of Hialeah. It is known as the Miami airport and also as the Hialeah Airport. The Florida Airways Corporation, air mail contractors, use this field.

The Florida Aviation Camp at Opalocka offers short flights and instructions.

A. S. M. E. AERON. MEETING IN BUFFALO

THE Aeronautic Division of the American Society of Mechanical Engineers will hold their national meeting at the Statler Hotel, Buffalo, on April 25 and 26.

The address of welcome will be made by Major Frank X. Schwab. Anthony H. G. Fokker of the Atlantic Aircraft Company will talk on "Transport Airplanes" and Bishop Clements of the Curtiss Aeroplane and Motor Company on "Metallurgy of Aircraft Engines." Inspection trips have been arranged to the Municipal Airport and the plants of the Curtiss Aeroplane and Motor Corp., Consolidated Aircraft Corp., Eberhart Aeroplane and Motor Corp., and G. Elias and Co.

Lieut. Harold R. Harris at Lima, Peru.

DUSTING PERU COTTON

THE first airplane cotton dusting with poison for leaf worm and plant lice as well as for the boll weevil is now being done at Lima, Peru. It is planned to dust more than 50,000 acres of cotton in the Canete and Chincha valleys with calcium arsenate distributed by five Keystone (Huff-Daland) duster type airplanes.

The expedition is dusting fields owned by A. B. Leguia, President of Peru, C. A. Colma, the largest cotton planter in the country, and also the plantations of Graham Rowe and Company. The expedition is headed by Harold R. Harris and the members include J. B. Pope, entomologist of the United States Department of Agriculture; Dan E. Tobin, pilot; Henry E. Elliott, pilot; M. L. Alexander, pilot; M. Montero Bernales, business representative in Lima; Richard Ewing, interpreter; W. C. Miles and W. E. Beach, mechanics.

FOR THESE KIND WORDS—THANKS!

"WHILE AMERICA SLEEPS," Cy Caldwell's remarkable contribution to Aero Digest for January, has attracted very wide attention. "La Conquête de l'Air" quotes it in full (for one example) with as an introduction the following comments of its own:

"The conflict of desires, passions and ambitions centering on the future of the Pacific Ocean makes it one of the world's most important problems. I learned what is to happen in this theatre of such importance to the human race when I opened the January issue of the Aero Digest, in which Mr. Caldwell in a few pages of sweepingly powerful imaginative writing unfolds to us the fate of American Naval Supremacy there. This he visions as coming true in 1930.

"I do not know what forced him to write this article nor on what facts he bases his prediction of such a disastrous end to unfortunate Uncle Sam, but I can say that his style and colors are so vivid and real that in several instances I was compelled to turn back to the fantastic dates of this imaginable report in order that I might assure myself that it was not made up of actual dispatches from a special war correspondent of the Aero Digest at Hongkong.

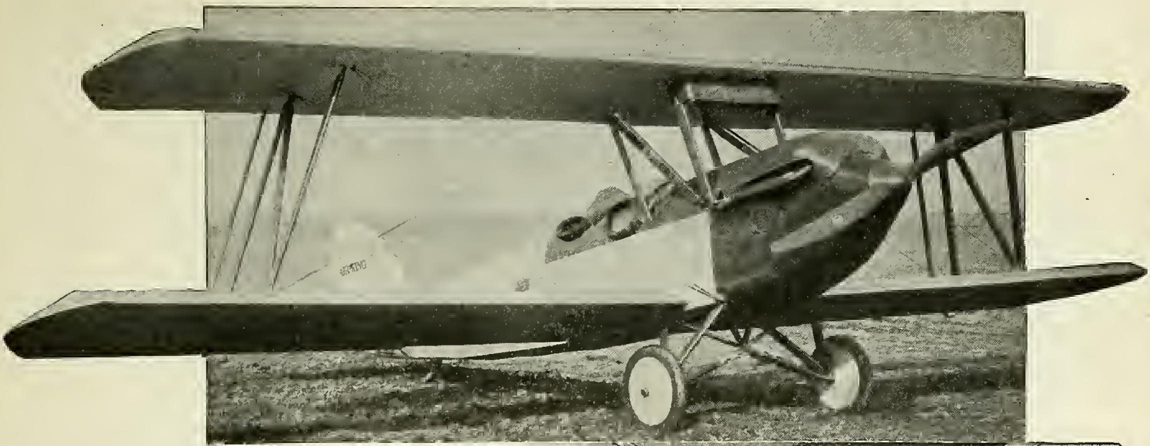
"Is it only imagination and desire to interest his readers which inspired Mr. Caldwell to write this article? Or may it not be rather a foresighted patriotism which dictated this touching warning?"

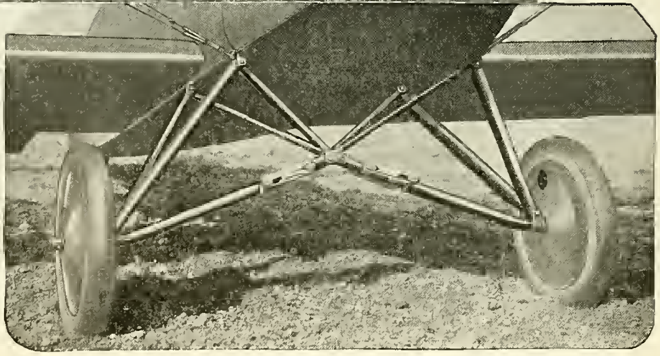
So popular was the January Aero Digest in Honolulu that Mr. A. W. Van Valkenburg, whose enthusiasm and tireless energy has done so much to arouse interest in aeronautics in Hawaii, cabled Aero Digest to rush him one hundred extra copies of the magazine.

Upon receipt of these magazines he wrote: "I distributed the copies to the members of the Board of Directors of the Honolulu Chamber of Commerce at the beginning of their meeting. I was somewhat embarrassed by what followed, for thenceforward the men seemed to be more interested in the magazine than in the proceedings of the business meeting.

"Other copies are being judiciously distributed, and when the Legislature convenes a few days hence I intend to see that each of the thirty Members of the House, and fifteen Members of the Senate receives a copy."

Saving crops in South America. Keystone (Huff-Daland) airplanes at Lima, Peru, dusting cotton with calcium arsenate.





Zooming Into Popularity

EVER since its first announcement there has been a veritable zoom of popularity to the "Air-King".

Commercial Fields, Aviation Schools and Sportsmen first enthusiastically inquired about and then eagerly bought this fine plane of its class.

And in all the letters of inquiry and in all our personal contact the most notable tribute to the "Air-King" is the fact that its price is generally placed in the prospective buyer's mind as being much higher than it really is.

Owners wonder how we can give so much for so little. It is true no one can give more. Our location, buying ability, and manufacturing facilities are unexcelled for economical production.

That is why we can give you—for only $2100—features found only on the highest priced airplanes.

1927 "Air-King" Improvement

Sturdy, shock absorbing split landing gear. (See illustration.)

Inspection windows in both lower wings permits inspection of aileron control wires and pulleys without removing fabric.

Aerodynamically improved wing tips and rudder for greater lift and maneuverability.

Clearer vision for pilot and passengers.

Cowling over entire motor keeps out rain and moisture.

Instrument equipped dash.

These added features to "Air-King's" original, efficient basic design make it worthy of its first place in the field in its class.

PRICE $2100
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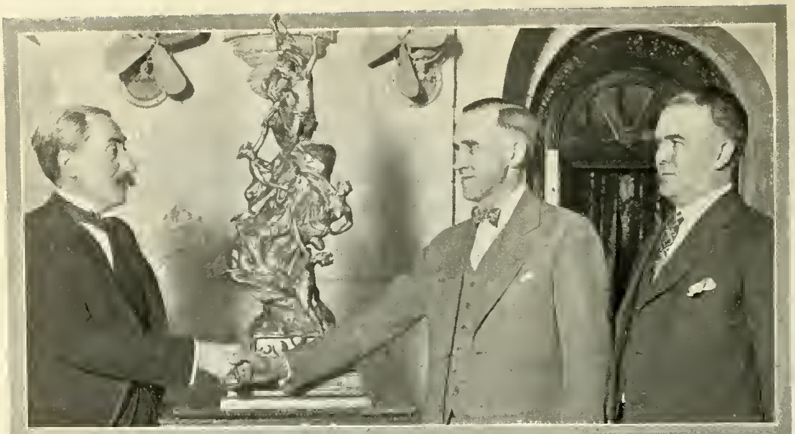
AGENTS:
GET OUR
PROPOSITION

NATIONAL AIRWAYS SYSTEM, LOMAX, ILL.



Baron de Cartier de Marchienne, Belgian Ambassador to the U. S., presenting the Gordon Bennett International Balloon Race Trophy to Ward T. Van Orman and Walter W. Morton, winners of the 1926 race held at Antwerp, Belgium.

BOSTON AIR NEWS

By G. W. Hamblin

ON March 5, exactly one hour after the wheels left the ground at Hartford, the Ford-built Stout all-metal airliner landed at the Boston Airport. Pilot Harry Brookes turned the big ship on the proverbial dime, and by repeating the process, finally had her right in front of the Boston Airport Corp.'s hangar. Then the passengers climbed out. With Harry Brookes were: William B. Stout and W. B. Mayo, of the Ford Motor Company, Major Talbot O. Freeman, of the Colonial Air Transport, Inc., and flying mechanic Harry Russell.

Immediately after the passengers had left the ship, workmen began unloading the parts of a Ford Roadster that were stowed away in the cabin of the ship. When they were all laid out on a raised platform, especially built for the purpose, crack mechanics began assembling the car. In twenty-one minutes, the car was running, and amid the cheers of the four thousand people, it was driven to the new Ford assembly plant in Somerville.

When Capt. Lyle C. White, flight surgeon with the Army boys, left the port, much discussion was aroused as to how soon another "Flying Doctor" would put in his appearance. The latest news that has trickled into operations is that Major Claude W. Cummings, who is now at Brooks Field, Texas, will be here the latter part of April.

This copy has been delivered to the offices of Aero Digest by means of the first trip of the Colonial Air Lines on their new night-flying schedule. The planes leave Boston at 6.30 p. m. now, instead of 2.45, and the mail closing at the Post Office in Boston is now 5.30, thereby giving the business men of Boston an additional four hours in which to get their mail aboard the ship.

Billings continues to enlarge the roster of the flying school operated by the Airport Corp., and has enrolled Edson and Wendall Jones of Roslindale; K. P. Chamberlain of East Dedham; J. P. Whittall of the carpet-makers family in Worcester and H. F. Mills of Lynn. The flying school now numbers forty, including solo-graduate students. Billings has maintained his record of ten hours flying instruction per week during the month.

BUHL AIRSTERS BOUGHT BY DEPT. OF COMMERCE

THE first planes to be purchased by the Aeronautics Branch, Department of Commerce, are two Buhl Airsters. Delivery of the first Airster was made March 23.

The Airster is the first plane to meet all engineering specifications and will be awarded one of the first certificates of air-worthiness.

SAUZEDDE WHEELS

PRODUCTION at the Sauzedde Corporation's plant, manufacturers of the Sauzedde brake wheel, is reported to be well established. Various sized wheels are being built for installation on a number of the new 1927 commercial jobs. Strength tests were made at McCook field recently on three sizes of Sauzedde wheels and excellent results were reported.

HUGH ROBBINS WILL OPERATE STOW FIELD

THE Robbins Flying Service headed by Hugh C. Robbins will operate from Stow Aviation Field after April first, negotiations having been completed between Mr. Robbins and Mr. Fred F. Smith, owner of the field.

The field is located six miles northeast of Akron, Ohio, two miles east of Silver Lake on main brick road and car line to City of Akron. Cuyahoga River and B.&O.R.R. two miles to the south of field. Latitude 41 deg. 10 min.; longitude 81 deg. 25 min.; altitude above sea level 1,140 feet.

The field comprises 100 acres. Runways are plainly marked. Hangar will accommodate five planes. Standard Oil Company's aviation gas and oil are always on hand. Interurban car and bus service take passengers from the entrance of field to Akron, Cuyahoga Falls or Kurt.

Mr. Robbins has had seven years' commercial aviation experience. His flying service consists of a school for pilots, aerial advertising, first cross-country transportation and aerial photography. Flying equipment at present consists of three planes. All pilots are invited to drop in at Stow.

MICHIGAN AIR MEET

THE Huron Valley Flying Club of Ypsilanti, Michigan, is planning to hold an air meet on July 1, 2 and 4. E. A. Goff, jr., the well known aeronautical executive and manager of the Huron Valley Flying Club, is in charge of the preliminary arrangements. Detailed information will be published later.

BUFFALO AIR NEWS

CAPTAIN MARCIAL ERREDONDO of the Chilean Army, Air Service Division, and his brother, Jorg, a civilian, are temporarily residing here. They are stationed at the Curtiss Company's Churchill plant in connection with the order that has recently been awarded that company by the Chilean government. At the present time Chile has but about 125 old type ships and the present order is the first step towards modernizing their air service with the latest type Curtiss planes. The order for these planes was secured after Lieut. Doolittle's daring demonstration over the Andes mountains.

The first tailor-made commercial ship built by the Elias Airplane Co. has been completed and is ready for its test flights. It is a three-place and is equipped with a 425 h.p. Liberty motor which will drive it at about 135 m.p.h. It was designed and its construction supervised by Max Stupar.

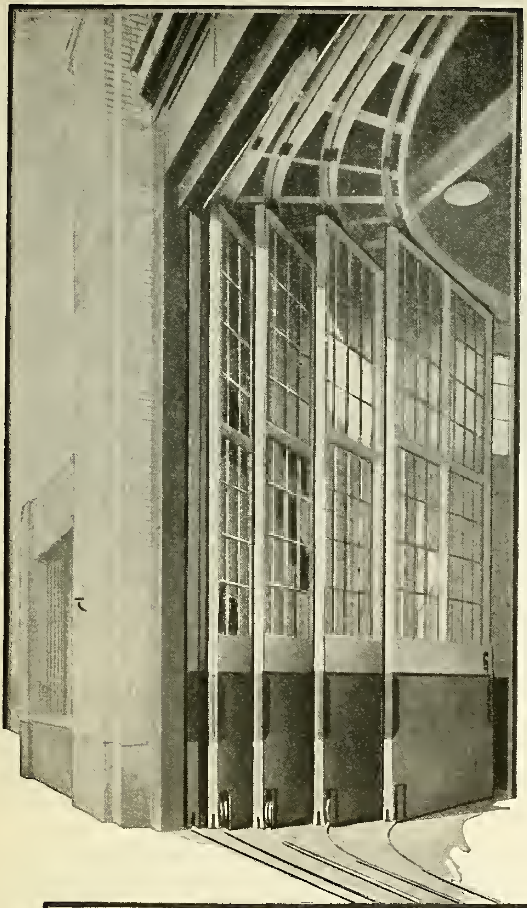
It was reported earlier in the month that Mitten Management, who operate the International Railway here, were considering the establishment of a passenger air line between Buffalo and Toronto but no further information has been received.

The Consolidated Aircraft Corporation this month completed plant improvements costing $100,000, which will increase its facilities to provide for an output of one complete airplane a day, it was announced by Major R. H. Fleet, president of the company. New buildings were erected increasing the floor space in the plant from 30,000 to 45,000 feet. More modern equipment was installed to insure quicker production of parts consistent with safety. The staff of engineers, designer and employees has been increased to 350 men.

In the two and one-half years that the Consolidated has been manufacturing planes, it has turned out 248 machines. Of these, 182 were built for the army and 62 for the navy. Major Fleet stated he has on hand government orders which will keep the plant working at full speed for the next three months, turning out one plane a day.

FLORENCE AIRPORT

A 60-ACRE field has been secured at Florence, South Carolina, by Dr. P. H. Brigham, Health Commissioner of Florence, which will be developed into a Class A airport within a short time. The terrain is level and hardly any work will have to be done to make the field "table level" throughout. There are no obstructions; prevailing winds are southwest. The field will be named the Florence (S. C.) Air Port and all flyers are invited to visit the field.



HANGAR DOORS

That Coast Open

Truscon Hangar Doors coast open! Roller bearings and correctly designed tracks and pulleys make it possible to open or close them with one arm! They are rigid, perfectly aligned, will not warp or stick and are of rust resisting copper-steel. They give fire protection and freedom from the danger of high winds, yet their ample window space admits plenty of daylight when closed. They roll back into small space for the free and unobstructed passage of planes. The nation-wide organization of Truscon will give you suggestions, estimates and complete information.

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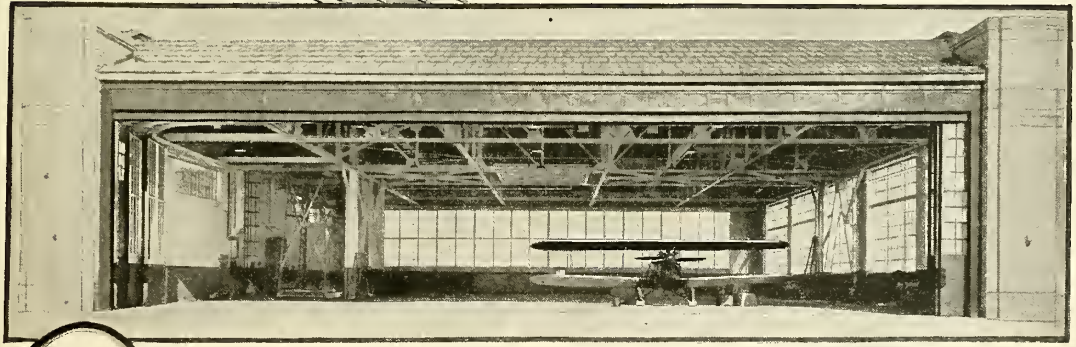

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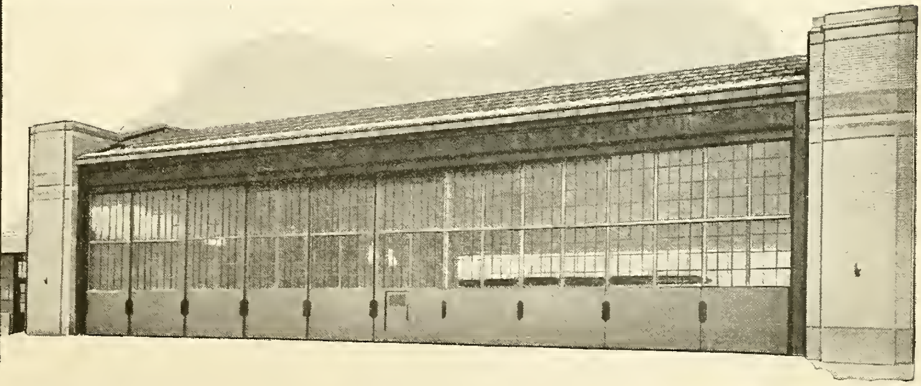


DETROIT AIR NEWS

By Frank Bogart

ANNOUNCEMENT that the Ford Motor Company would operate its three-motor Stout all metal transports to Buffalo not later than April 1, extending its private air freight service, and later opening the line to passenger travel, was the outstanding event of March in Detroit aviation circles.

Arrangements have been completed for Ford passenger planes to connect at Buffalo with those of Colonial Air Transport for New York and Boston. At Chicago similar arrangements will soon be concluded with National Air Transport, Inc., reaching to Dallas, Texas, and with Northwest Airways, Inc., for St. Paul and ultimately further. Thus the beginnings of passenger air travel along main trunk lines are already within sight.

On March 16 the Ford Company and Stout Air Services, Inc., operators of the 142-mile passenger line from Detroit to Grand Rapids, which was opened August 1 last year, coöperated with the aviation supporters of Grand Rapids in staging an "Aviation Day," with Commander Richard E. Byrd, Jr., as guest of honor.

Byrd flew from Detroit at the controls of one of the Ford trimotor machines, taking Mr. Mayo as his passenger. Two single engine Ford-Stout planes, belonging to the line, accompanied him, with newspapermen and photographers.

This was the first formation flight of Ford airplanes. Not more than two of them had ever before been in the air (except over the airport at Dearborn) or on a trip of any length, at the same time. Six army pursuit hawks from Selfridge Field, under Major Thomas G. Lanphier, went along to give the crowds some "atmosphere."

The turnout was about 25,000. Byrd delivered his North Pole lecture to a standing room crowd in the evening. Grand Rapids, about 175,000 people, is one of the most "air-minded" towns in the country, and possesses a Class A municipal airport. It is the only airport known to this writer which has a real terminal building, containing the local offices of the operating company, rest rooms, etc. Thanks for this are due largely to the Grand Rapids Aero Club.

Stout made his third cut in fare early in March in the seven months he has operated the line. The rate is now $16 each way. It started at $25 and dropped to $18. The new rate is less than three times the rail fare, if a Pullman charge is added.

On March 22 Ross W. Judson and W. R. Angell, president and vice-president of Continental Motors, who are developing a sleeve valve airplane motor, left in the company's ten-passenger Fokker on what will be a 6,000-mile business trip through the South and West.

Underwood & Underwood.

Shirley J. Short, air mail pilot, and the Harmon trophy presented to him by President Coolidge.

John Duval Dodge, son of the late motor magnate, had business in South Bend, Ind., in the middle of February. His pilot, Billy Brock, and he hopped off in Dodge's Stinson-Detroiter, a four-passenger cabin job. They did not return to Detroit until March 16. In the meantime they had covered 5,600 miles, touching Kansas City, El Paso and finally San Diego. From there they roamed up and down the West Coast before they came on home. They just bought new shirts, razor blades and the like when they happened to need them. That's aerial gypsying with a vengeance. The other Dodge heir, Horace E., Jr., also owns a Stinson machine.

There is every probability that the Michigan legislature will pass a bill providing $100,000 for a permanent seaplane training base for the Second Naval Reserve District, which will be located on Grosse Ile, an island near the mouth of the river.

This Grosse Ile airport may become a municipal one if the united support of all aviation bodies can be obtained, a factor which has stood in the way of Detroit obtaining such a port, although it seems that nearly every other city in the world, including Jerusalem, has now got one.

Grosse Ile port is 200 acres, with a splendid seaplane harbor. In fact the port has water on three sides. It is in the line of travel in and out of Detroit, away from the industrial rumpus and smoky haze, where the radio beacon signal system can operate ideally if the plans to make it a transcontinental air mail point develop.

Bids covering this were to be filed in Washington late in March. The American Express Company has already contracted with the National Air Transport, Inc., for an overnight express service between New York and Chicago, touching here. This starts about May 1.

To get back to the Naval Reserve. Their first training plane has arrived. They have a temporary hangar and the flight commander, Lieut. Charles D. Williams, jr., expects one more soon. He has 60 men in the squadron.

Stinson Airplane Corporation has sold two more machines to Patricia Airways, operating in the Red Lake region of Ontario, making a fleet of three. The company is working full force, as are the Hess and Buhl concerns, the other local builders.

ATLANTA AIR NEWS

By Walter B. Ratliff

ATLANTA'S Rotarians and all other boosters of this Georgia metropolis were borne away on transports of pride last month when W. Irving Glover, second assistant postmaster general, announced that Atlanta is to be connected with the Pacific Coast by an air mail route.

Mr. Glover was an over-night visitor here when he dropped in to call on Postmaster E. K. Large and Alderman W. B. Hartsfield, chairman of the city's aviation committee. The direct purpose of his visit was to discuss the opening of the Atlanta to New York air mail route which was awarded to the Pitcairn Aviation company.

The Atlanta to New York project will be lengthened to Birmingham and New Orleans, Mr. Glover said, and then, as soon as it is possible to make the extension, it will be pushed on to Fort Worth and thence by the southern route to Los Angeles.

Plans of the Pitcairn Aviation Company to open the New York to Atlanta air mail route are being pushed to the limit, it was declared here by James G. Ray, manager of operations, on a visit to Atlanta preparatory to starting the line.

Tentative plans of the company call for construction of a hangar at Candler Field and it is probable that the city will grant the company the privilege of constructing a hangar on the field at a nominal lease price for the land occupied. The company is considering opening a school for pilots as soon as operations are gotten under way.

NEW INDIANA COMPANY

THE Calumet Air Transport Company, Inc., was recently incorporated under the laws of Indiana to engage in the manufacture of airplanes and commercial flying. The capital is $25,000.

Walter W. Myers of Chicago, Ill., is to be general manager of the corporation, and will have full charge of the plant now being constructed at 60th Street and Broadway, Gary, Ind. The field connected with the plant contains 80 acres, and is level and well drained.

Present plans call for the construction of 12 commercial planes the first year, designed by Roy E. Guthier of Chicago, which will contain some novel features such as duralumin rib construction in the wings. Mr. Guthier has had an experimental ship operating for one year, and the new production will follow this model. The corporation will also teach aviation and run a general repair business.

Mr. Myers and Mr. Guthier are well known in aviation circles around Chicago, having operated there for years. They have been associated with aviation since 1917, both having been Lieutenants in the Army Air Service.

The officers of the corporation are: Walter W. Myers, president; Adolph Ostedt, vice-president; and Dr. D. C. Dalbey, secretary and treasurer. In addition to these officers, Roy E. Guthier constitutes the board of directors.

ANNOUNCEMENT!

The name of

Huff Daland Airplanes, Inc., of Bristol, Pa.

has officially been changed to

Keystone Aircraft Corporation

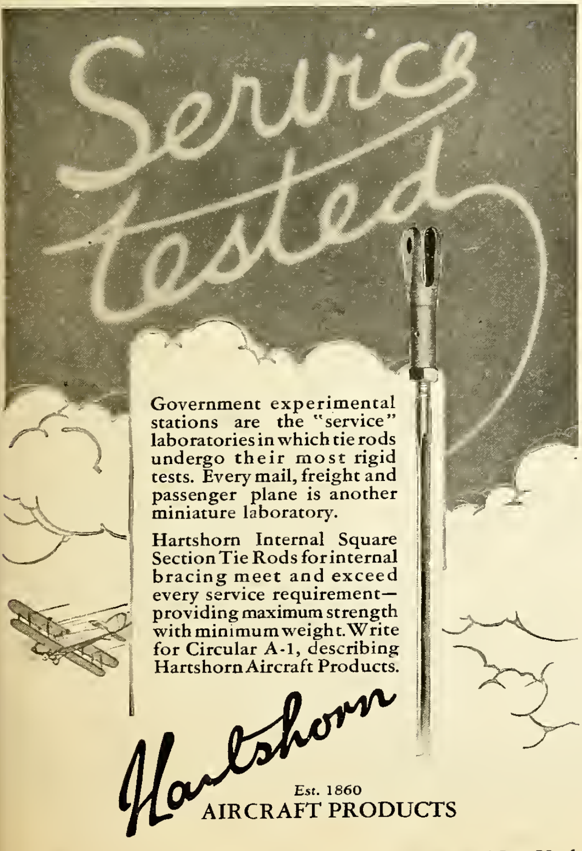
Effective March 8th, 1927

The Company announces a progressive manufacturing production of the following standard types that have been identified with the former name:

PETREL	—An ideal commercial 3-passenger biplane; useful load 1200 pounds.
PUFFER	—The premier commercial cotton dusting airplane.
PELICAN	—5-purpose convertible training plane.
PATHFINDER	—The ultimate commercial long range 3-engined 14 passenger plane; payload 4500 pounds.
PEGASUS	—Fast single engined light bombardment plane.
PIRATE	—Twin engined light bombing or transport plane.
CYCLOPS	—The largest single engined bomber in America.

See further announcements for other types now under development

KEYSTONE AIRCRAFT CORPORATION
BRISTOL, PENNSYLVANIA



Government experimental stations are the "service" laboratories in which tie rods undergo their most rigid tests. Every mail, freight and passenger plane is another miniature laboratory.

Hartshorn Internal Square Section Tie Rods for internal bracing meet and exceed every service requirement—providing maximum strength with minimum weight. Write for Circular A-1, describing Hartshorn Aircraft Products.

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prepare now for your job
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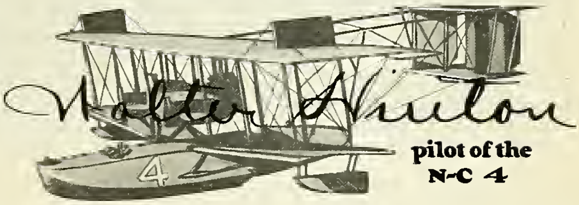

pilot of the N-C 4

The Universal Growth of Aviation

is constantly creating new opportunities for men as pilots—mechanics—riggers—aeronautical engineers—inspectors and other well paid positions.

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in accordance with the new government regulations which require certain definite standards.

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is the name of the absorbingly interesting booklet which tells *you* the details about *your* place in aviation and how to acquire it.

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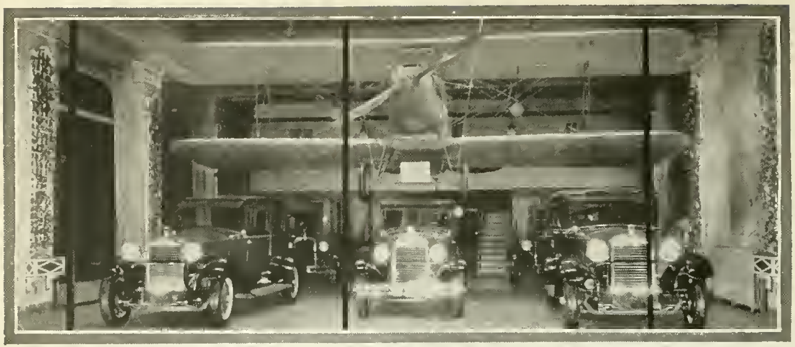

The Columbus (Ohio) Flying Service exhibits a Waco airplane in the window of the Hudson-Essex automobile show room.

THE MIDDLE WEST IS CARRYING ON

By Ralph W. Cram

A short time ago, as I stood in the middle of a level 80 acres that Hanford Mac Nider Post of the American Legion has leased as an airport for Mason City, Ia., my thoughts embraced also similar movements out in our part of the country, and formulated themselves thus:

"The Middle West is carrying on."

Take the case of Mason City, for instance. These flying Legionnaires, and a few who have later learned the secret of safe landings, have been sideslipping year after year into one handy field after another, as the town grew and crowded them out, until the city's need of a permanent field forced itself upon them. It happens that the American Legion at Mason City, by reason of its weekly "old style" dances, famous through that section, is the best heeled organization thereabouts. So it located this fine "eighty," with more level ground all around it, and has leased it for two years, after which the local Chamber of Commerce agrees to share the load. Improvements are to be planned, and the field is to be dedicated with appropriate ceremony this summer.

Mason City points with pride to its location on the north and south route from the Twin-Cities to Des Moines and beyond, and expects to claim its place on the air map. Flyers going that way can land on the field "from now on," for it needs little but a mark.

Des Moines Leases a Quarter

Out here in Iowa 160 acres is just "a quarter," and that is the unit Des Moines, the capital of Iowa, picked for a municipal field, just recently leased, and to be the Des Moines airport hereafter. Des Moines has been on the transcontinental air mail route, but the mail field was poorly located, and it realizes that a better airport is necessary if it is to make a successful bid for air commerce.

How Cedar Rapids Built a Hangar

Over at Cedar Rapids, Ia., they have a municipal landing field and thereby hangs a story.

The Chamber of Commerce there leased the field for three years, and bought lumber for a hanger. Right there it ran out of money, or at least reached the limit of its airport budget. What to do?

"We'll build the hangar," announced the local Federation of Labor. So it assessed each of its members $1 per, and the fund, of several hundred dollars, was used to pay the union carpenters who forewith built the hangar. They were assessed their dollar like the others, but no one had to work for nothing.

Two Fields in Sight at Davenport

Here at Davenport, we have two fields in prospect, besides the big one at Moline, another of our Tri-cities.

The Davenport Airport is being developed on the northwest edge of the city, where hangars were built last year, and service installed, and further fields are to be added to the airport area this year.

Up the Mississippi, also, former Wallace Field is to be cleared again, and be the home field of the Davenport Flying Club, a social organization which will welcome visitors but refer them for service and commercial flying to the Airport.

The Central States Aero Company is entering the ranks of aircraft builders, too, building a light chummy two-place plane around a Rickenbacker motor.

Over at Monmouth, Ill., there's the Midwest Airways; and down at Wichita, and out at Lincoln and Denver, and a lot of other places, as all the fans know, "the Middle West is carrying on." Why, down the river aways, they are building the town of Lomax, Ill., around an airplane.

NEW WIND TUNNEL FOR NEW YORK UNIVERSITY

NEW YORK UNIVERSITY is now installing, in its new Daniel Guggenheim School of Aeronautics, a wind tunnel which, when completed, will represent the most up-to-date equipment in existence in this country for testing airplane models. Air velocities in the tunnel will, it is estimated, exceed 100 miles per hour.

The college of engineering in that university already has available for aeronautical study a four-foot wind tunnel of the British National Physical Laboratory type in which experimentation is conducted up to air velocities of 60 miles per hour. Although primarily employed for purpose of instruction, the tunnel is available for tests and investigations in the study of airplanes and airships in such allied fields as ventilation, the study of fans and windmills and the measurement of wind pressure on structure.

The Daniel Guggenheim School of Aeronautics is now in a new building erected on the campus of the University, and the new wind tunnel is housed in that building. This tunnel will be of the double-return type, having a diameter of nine feet at the working section and an overall length of 110 feet. It will be employed for the testing of airplane and airship models, for the study of aerodynamics or the science of air flow and for problems in ventilating and heat transference.

The tunnel will be electrically operated, all the electrical equipment being supplied by the General Electric Company. The wind tunnel fan will be driven by a 250-horsepower direct-current motor direct connected to the fan shaft revolving at 600 r.p.m.

A very elaborate system of control will be used, allowing the fan motor to be started and stopped without the necessity of starting or stopping the motor generator. Fine adjustments of fan motor speeds and resulting wind velocities will be possible by the use of the variable voltage system of control. A small switchboard located in the scale room will allow complete control of the wind tunnel motor by the person taking the readings in the scale room.

John B. Moore, president, and Larry D. Ruch, test pilot, Arrow Aircraft Corp.

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BELDEN *shielded* wiring harness for radio, starting, lighting and ignition was used on the U. S. Air Corps Standard DeHaviland-4 Planes, the first planes adopted by the U. S. Army during the World War period. The use of Belden shielded harness provided an *unusually reliable wiring job of light weight at low installation cost.*

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SPLITDORF COMPANY PROMOTES PORTER

ROBERT W. PORTER, general sales manager of the Splitdorf Bethlehem Electrical Company, has been elected vice-president in Charge of Sales. At the last meeting of the Board of Directors, Mr. Rautenstrauch, president of the company, reported the results of a thorough canvass of the territory in which the Splitdorf company is represented by 10,000 dealers, and stated that commitments on 1927 business were already in advance of 1926. He announced an annual saving of $200,000 as the result of improved manufacturing methods which were recently introduced.

AKRON BALLOON RACE

THE National Elimination Balloon Race for the Litchfield trophy will be held at Akron, Ohio, on May 29th.

The cash prizes will be: first prize, $1,000; second, $800; third, $500; fourth, $300; fifth, $200. An award of $100 will be given to the pilot of each balloon starting in the race.

As there are already twelve tentative entries, it is likely that the coming race will be the largest held in this country.

TWEED BROTHERS HESS DEALERS

IT was recently announced that the Tweed brothers, who are operating the New Haven Terminal, have taken on the Hess agency for Connecticut and all of New England. There is a very active school at the New Haven Air Terminal, for instruction in sea planes and flying boats. The Hess "Blue Bird", equipped with metal pontoons, will be used as instruction ships in addition to the dual control boats for those who want flying boat instruction.

AIR MAIL BIDS ASKED

BIDS will be opened at the Post Office Department, Washington, D. C., May 17th, 1927, for carrying mail from July 1st, 1927, to June 30th, 1928, over the following routes:

New Orleans, La., to Pilottown, about 80 miles and back, or to Port Eads, La., about 92 miles and back, connecting with outgoing and incoming steamers.

Seattle, Wash., to Victoria, B. C., about 84 miles and back, connecting with outgoing and incoming steamers.

RESISTAL ADOPTS RUBBER CUSHION

THE Resistal goggle, well-known to flyers for many years, has changed the style of the cushion fits around the face, from fur to sponge rubber. The new rubber cushions will not collect dirt and grease as they are easy to clean. The new goggle also affords greater ventilation and, due to the pliability of the sponge rubber, they conform naturally to the shape of the face, affording much greater comfort.

The new style number is RAV, meaning Rubber bound Aviator style with Ventilating attachments. The lenses are Resistal.

MATERIALS

For Aircraft Manufacturing Re-inforcing tape, Packing Tape, Shock Absorber Cord, Radiator Web Manufactured to Army and Navy Specifications
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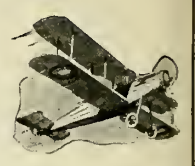

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TITANINE PLANT IS DESTROYED BY FIRE

THE manufacturing plant of Titanine, Inc., at Union, Union Co., N. J., was almost entirely destroyed on the night of March 24th. The fire, it is reported, started while one of the large dope tanks was being cleaned out, quickly spreading to other tanks then into the storage room where large quantities of dope and varnish were being held for shipment.

Fortunately no one was seriously injured although a number of employees were in the building at the time.

E. G. Davis, general manager of Titanine, Inc., reports that plans are already under way to build a new and larger plant with greater production capacity than the old one.

Although the facilities for delivering large quantities of material are at a standstill for the present, half production will be resumed within a month. Small orders can be taken care of immediately as the fire did not reach the small tanks.

BROWNBACK IN FRANCE

H. L. BROWNBACK of the Brownback Motor Laboratories is in France making a study of the conditions in the airplane and automobile motor field. Mr. Brownback makes a trip abroad every year for the purpose of keeping up with the latest developments in motors

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Lawrance A-3 28 h.p. 2-cylinder, air cooled motor complete with propeller, for light plane. Price only $87. We have only a few motors left and this is the last chance for you to get them at this price. Wire us deposit and we will hold motor for 30 days.

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Anzani 110-120 h.p. 10-cylinder radial, air cooled motor. This is the best motor built for 3-passenger commercial planes. Price $455 while they last. (Weight 390 pounds).

We carry Liberty 4s, 6s and 12s, Hall Scott A7A, Curtiss V-2, OXX6 and OX5, Mercedes and many other motors. Also a large supply of spare parts for all types of motors.

Protector Goggles in Leather Case	$ 9.00
Resistal or Triplex Goggles	4.00
French Gogglettes in Tin Case	4.50
Air Mail Type Leather Helmets	5.00
Cloth or Silk Lined Helmets	5.00
Fur Lined Winter Helmets	7.50
Latest Style Soft White Leather Lined Helmets	9.00
Seal Skin Lined Helmets	12.00
Flying Suits (White or Khaki) Double Breasted	9.00
Extra Heavy White Flying Suits—Special Made	12.00
French Shock Cord (per foot)	.10
OX5 Standard or Oversize Rings	.15
Hub Puller	1.00
.003 Oversize Wrist Pins	.50
Jenny Landing Gear Struts—Front ea. $1.25 Rear ea.	1.75
Wing Skids—Steel (each) $1.00—Wood (each)	.75

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NOTE—Due to a fire which recently destroyed our plant there will be some delay in filling large orders. Within a short time we will be able to renew regular shipments to our customers.

FOREIGN AERONAUTICAL NEWS IN BRIEF

SOUTH AMERICA

THE Uruguayan flyers, Major Tadeo Larre-Borges and his three companions, whose plane developed a leak in the oil system and was forced down on the West African coast while trying to fly from Africa to South America, arrived at Cape Juby settlement safe and sound, but minus most of their personal belongings.

They were captured and held for a week by the Moors who hoped to obtain ransom from the Spanish Government. Leaving Marina di Pisa, Italy, on February 20, a week after the departure of de Pinedo, Major Larre-Borges intended to terminate his flight across the Atlantic at Montevideo, Uruguay. If the plane can be repaired or another can be obtained, they will make another attempt.

CHILE'S first air mail service was inaugurated in February for the transportation of foreign postal pieces between the port of Valparaiso and Santiago. The innovation is of great importance to business houses in the Chilean capital, for under prevailing conditions all correspondence from that point for foreign countries must be mailed the day preceding the mail steamer's departure from Valparaiso. Under the new system, the Santiago Post Office will not close its pouches until the morning of the day on which the steamer sails. A further advantage is that mail from abroad will be distributed in Santiago a few hours after its discharge from the ocean mail carrier.

A Dornier hydroairplane, "Mercurio", was disembarked at Vera Cruz on March 6. This plane will be used to establish air service between Vera Cruz, Puerto Mexico, Frontera, Laguna, Campeche, and Progreso. The plane will leave Vera Cruz one hour after the arrival of the night train from Mexico City. The price of passage from Vera Cruz to Progreso is given as $60, the same as the first class fare on vessels of a steamship line between those two points. It is an all-metal monoplane with a weight of 2½ tons with a capacity for eight passengers or one ton of cargo. The crew will consist of a German aviator, who has been doing considerable flying in Mexico for several years, and a Mexican mechanic. The name of the company having the concession for this service is Aereo Lloyd, Cia., Naviera Aerea del Golfo de Mexico.

MAJOR SARMENTO BEIRES, Portuguese round-the-world flyer, completed the crossing of the Atlantic Ocean, arriving at Port Natal, Brazil. He flew from the Island of Fernando Do Noronha, 120 miles off the Brazilian coast, where he arrived on March 17 from the Bissagos Islands near Bolama, Portuguese Guinea, Africa. His flight from Bissagos Islands to Fernando do Noronha covers a slightly longer route than that taken by Commander Francesco de Pinedo, the Italian aviator, in his recent crossing of the South Atlantic. Major Beires's projected flight around the world in ninety days, which started from Lisbon on March 2, touches South America, the Soutern Pacific Islands, Australia and India.

SIGNING by Paraguay of the Aero-Navigation Convention between Spain and the Hispanio-American nations has been authorized by the executive power.

FRANCE

DURING the past twenty-two months the Japanese Government has purchased 172 French planes at a cost of $7,000,000.

Further orders for many more planes are said to be in the process of execution at French aeronautical factories. Sixty of the planes already delivered are described as being large bombers. All are reported to be in service, the handling of the shipment to Japan having been arranged through the Japanese Air Mission, which has been in France for several years.

AN important step in the development of the French automotive industry was taken recently when the preliminary organization of a "Societe Francaise des Ingenieurs de l'Automobile et de l'Aviation," similar to the American Society of Automotive Engineers, was begun.

A committee was appointed to prepare detailed plans and a "secretariat" was ordered established at 102 Rue La Boetie, Paris.

Until the present time, French automobile and aeronautical engineers have worked entirely independently despite the fact that many questions of common interest could be solved by a technical organization.

THE newspaper, the *Matin*, has offered 30,000 francs for a trophy to be presented to the first plane of French make with a French motor and French crew which makes the transatlantic flight. All the artists, sculptors and jewelers in France have been called on to join in a contest for a design for the trophy.

Aero Digest, brought by the Stirling expedition, is the first magazine ever seen by the natives of Dutch New Guinea.

JUNKERS-

All Metal Aircraft

JUNKERS FLUGZEUGWERK A.G. DESSAU (GERMANY)

JUNKERS CORPORATION OF AMERICA. 342 MADISON AVENUE. NEW YORK CITY

Herbert Photo.

The "globe-trotting" airmen of Uruguay. Left to right—Commander Larre Borges, Captain Ibarra, Captain G. Borges and Mechanic Rigoli.

GERMANY

THE close of business in 1926 shows that German airplane lines carried about 40,000 passengers and large quantities of freight and mail. The success has encouraged the erection of new lines which are planned as follows: Service will be inaugurated between Silesia and Stettin; another service between Breslau, Prague and Munich, and a line from Gleiwitz to Vienna. Another line from Danzig to Kalmar, in Sweden, is to be put into service. A line from Cologne to Duisburg (Ruhrort) and Rotterdam is to be operated with hydroplanes flying over the Rhine. Additional planes are to be put on the lines between Berlin, Amsterdam and London. An increased service will be maintained between Munich, Milan and Rome. A 3-months service is planned between Stettin, Goteborg and Oslo. In the next half of the year a service from Germany through Basel, Geneva, Marseilles, and Barcelona to Madrid is planned. The air line to Russia may be changed so that flights will be made over Riga instead of Reval. This depends upon the improvement of the landing field in Riga. If such an improvement does not take place, a branch line will be run between Reval and Riga.

HERR SCHNAEBELE, who made the first flight from Berlin to Peking, established a new world record on March 17. He ascended in a Junkers plane carrying half a ton dead weight and remained in the air 16½ hours. This beats by nearly two hours, the record made on June 24, 1926 for Class C airplanes carrying a load of 500 kilograms (1102.31 lbs.) by the Swiss flyers, W. Mittelholzer and G. Zinsmaier in a Merkur-Dornier plane.

On March 21st, a Junkers type J33 monoplane with land equipment and a Junkers L5 motor established a distance and endurance record on the Dessau Leipsig Air Route. The plane piloted by Schnaebele and Losse took off with a useful load of 1,100 lbs. The trip was made in 22 hours without any difficulty. The distance measured by the Board of Aeronautics is 1,700 miles. The previous world record was 15 hours and 1,520 miles. During the record breaking trip fuel was consumed at the rate of 75 lbs. per hour and the oil consumption 13 lbs.

LINERS of the North German Lloyd Company have been equipped with planes for the service of passengers who wish to make quick landings or an opportunity to view ports from the air.

AFTER Germany's re-entrance in the Federation Aeronautique Internationale the large commercial airliner, Rohrbach-Roland, equipped with 3 BMW type IV engines, was the first land plane of German origin which attempted, on February 4th, 1927, to break some of the world records. The machine was piloted by Chief Pilot Steindorff of the Deutsche Verkehrsfliegerschule at Staaken. A triangular course of 100 km., Staaken-Buckow-Brandenburg-Staaken, was chosen for the flight. The machine weighed 3,830 kgs. and carried a useful load of 2,000 kgs. consisting of iron rails and leaded sandbags. Weight of flying structure, including crew, fuel and oil, and useful load, was 7,100 kgs.

The following world records were established:

1. With a useful load of 1,000 kgs.: Speed over 500 km.—165.9 k.p.h. Last record, 163 k.p.h., made by W. Mittleholzer and G. Zinsmaier of Switzerland.
2. With a useful load of 2,000 kgs.: Endurance—4h, 17' 49". Last record, 4h 4', made by Bajac and de Lamothe of France.
3. With a useful load of 2,000 kgs.: Distance on closed course: 600 km. Last record, 500 km., made by Bajac and de Lamothe of France.
4. With a useful load of 2,000 kgs.: Speed over 100 km.—173.9 k.p.h. Last record, 150 k.p.h., made by Bajac and de Lamothe of France.
5. With a useful load of 2,000 kgs.: Speed over 500 km.—165.9 k.p.h. Last record, 147 k.p.h., made by Bajac and de Lamothe of France.

ENGLAND

FLIGHT Lieut's. C. R. Carr and L. E. M. Gillman are planning a non-stop flight from London to Karachi, India, a distance of over 3,500 miles, during May.

They will fly a Hawker Horsley 700 h. p. Rolls-Royce Condor airplane, which will carry over 1000 gallons of gasoline and which, it is hoped, can remain in the air for 48 hours at a minimum speed of 100 miles an hour.

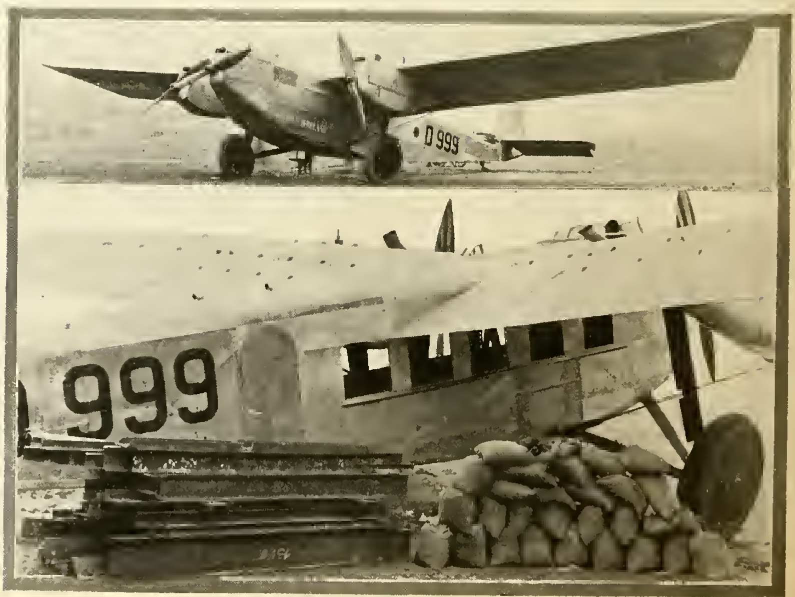
CANADA

CAPT. JOHN CLARKE, late of the R. A. F., Flying Officer Gilbert Jenkins of Melbourne, Australia, and Engineer L. T. Palmer, late of the Royal Canadian Air Force, are in Vancouver, planning a trans-Pacific flight from that city to Honolulu, thence to Sydney, Australia via the Fanning and Fiji Islands. They will be joined by Capt. F. A. Giles of Adelaide, Australia, navigator. A 3-engined Sikorsky seaplane, now being constructed in New York for the Canadian attempt, will be shipped by rail and assembled in Vancouver for the flight early in June.

THE Royal Bank of Canada is to be commended on its public-spirited action of publishing and distributing free of charge the very excellent book, "Canada and the Twentieth Century," by Dr. D. M. Marvin and Mr. J. E. Van Buskirk.

The purpose of this book is threefold: (a) to bring to Canadian readers a fresh realization of the remarkable growth and vast resources of their young country; (b) to convince non-Canadian readers of the great opportunities of Canadian trade; and (c) to supply to both classes of readers a store of information and a reference record at once concise and complete.

Copies of "Canada and the Twentieth Century" will be mailed free of charge to bona-fide applicants, addressing The Economist's Department, The Royal Bank of Canada, Montreal.



The Rohrbach-Roland and the load it carried in making five new records.

Like Flying-

The kick of an HS-1 "on the step"!
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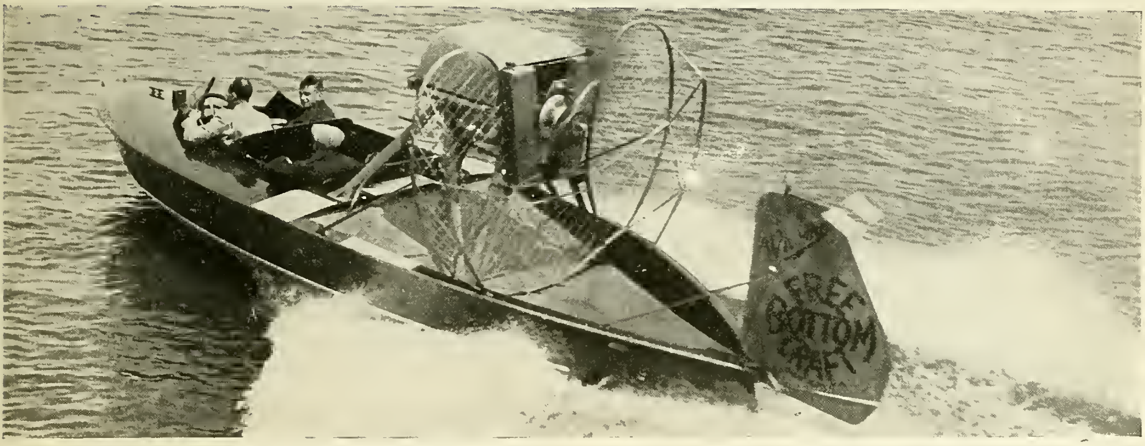

THE Whistler requires but a five inch draft. It goes anywhere. With it you will learn the thrill of riding across the shallow spots, through shoal water and grasses, or planing along on the foaming crests outside and you ride like the wind with the cockpit dry, wherever you travel!

The Whistler is a practical seasoned runabout . . built by the makers of seaplanes for the U. S. Navy. It is powered with the old reliable OX-5 and has a speed of better than 30 miles per hour.

The Whistler runs and drives like a car. Stability is given by its VEE bottom and generous beam. It will actually bank in on the sharpest turn. Equipped with electric running lights and electric self-starter. Engine noise is practically silenced with auto-type mufflers.

A limited number of Whistlers are now available for early spring delivery. May we not discuss details with you now so that you may enjoy the Whistler this summer? For particulars address

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Exhibition parachutes that are reliable at all times and under all conditions.

Single, double or triple drop acts rigged up to operate perfectly.

The name "Hardin" stands for reliability in parachutes.

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Hardin Parachute Co., Minneapolis, Minn. Please send me price list and literature on Hardin Parachutes.

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AERO DIGEST will award a prize of $5 each month for the best humorous contribution published. Only those pertaining to the aircraft field will be considered. Address the "Picked From The Air" Dept., Aero Digest, 220 West 42nd Street, New York, N. Y.

Kenneth D. Stern, St. Louis, Missouri, won the prize for April.

An aviator on a cross-country flight over the Smoky Hill country of the Carolinas becoming lost and deciding to land to get his bearings, set his ship down in a likely looking clearing—the only one in miles—on the edge of which sat a dilapidated looking, deserted negro cabin; typical of the uninhabited aspect of the rolling, wooded hills.

As he crawled out of the cockpit he was approached by a little darky who stared at him in awed silence, with wide wondering eyes.

"Well, Sammy," spoke the pilot, "where am I?"

"Ah dunno, sah, whar yo' is. Dis's jist Pappy's clearin'."

"You don't?" returned the pilot, lifting a quizzical eyebrow. "Don't tell me you don't know what county you live in?"

"County?" The boy shook his head wonderingly. "County? No, sah. Ah nevah hyard Pappy tell o' any county. We'se jist lives hereabouts."

"Oh, you do, do you?" came from the pilot, growing a little nettled. "Well, maybe you can tell me what the name of the nearest town is, and which direction it is."

"De neares' town, mistah? We'se nevah gone to no town. De closes' away we goes is to de sett'ment down to de cross roads."

"Well!" exclaimed the pilot, feeling a little relieved. "Suppose you tell me what the name of this settlement is."

" 'Tain't got no name, mistah. Yit's jes' Jeff Setters sto' down to de cross roads. Leastwise dat's whut folks calls it."

By this time thoroughly exasperated the lost one turned on the little imp of darkness and barked: "Well, what do you know anyway?"

The pickaninny gravely regarded his questioner a moment and then, scratching his woolly dome replied unperturbably:

"Ah knows ah ain't lost, Mistah."

Jack: "Say Jim, if war breaks out again, which are you going to join, the Army or the Navy?"

Jim: "I'm not going to join the Army because they feed them beans, and I'm not going to join the Navy because I can't swim."

Jack: "What are you going to join then?"

Jim: "The Aviation Corps."

Jim: "What do they feed an aviator, Jack?"

Jack: "Birdseed, I guess."

—Vincent G. Shinkle, Jr.

An exhibition aviator flew before a slim crowd at a small fair in the Rio Grande country. As the treasurer counted out the flyer's percentage, he sniffed the soiled money handed in at the box office by the small crowd. "Hope you ain't scairt of microbes," said the treasurer.

"No!" retorted the flyer, "no microbe could live long on this share of mine!"

Alec: "How's tricks, Dan?"

Dan: "We nearly had a accident with our home made airplane yestiddy. Bill, my hired man, fell outta th' seat. He broke out all his front teeth, busted six ribs, sprained his ankle, twisted his knee, and cut his face. But we was sure lucky. Th' machine wan't hurt a bit!"

—Mont Hurst.

Fellow Aviator to friend who finished his tests to apply for flyer's license: "How did you get along in the exams?"

"I failed. What else could you expect? They asked me about things that happened before I was born."

It was at a recruiting station during the war, when a captain in the Air Service seeing a colored gentleman desiring to enlist in the Artillery, remarked:

"Sambo, why don't you enlist in the Air Service where you are given a beautiful pursuit plane, sailing forth when the commander gives the order to charge, and shooting down the enemy right and left——"

"Look heah, Captain," Sambo replied, "when de captain gives de command to retreat, ah don't wan't no good looking ahplane holding his heah nigger back."

—Frank C. Tryer, Jr.

Mirandy (To her husband): "Huh—s'bout time yo' all done got yo' seff a job, you lazy nigger!"

Rastus: "Honey, I'se not lazy. I'se on'y been out o'work fo'teen weeks."

Mirandy: "Hush, nigger, hush! The mo' I hears yo' talk, the mo' yo' all 'mind me of a airship!"

Rastus: "Airship! How come—'cause I'se such a high flyer?"

Mirandy: "No—doggone yo' black hide—cause yo' ain't no use on his earth!"

—Frank E. Davis.

Double Circulation!—Triple Patronage! —and still increasing our lead on the field!

To the man who investigates the publications covering a market before he spends any money in advertising, a comparison of the mediums in the aircraft field will leave no doubt in his mind as to the leadership of Aero Digest

because—

¶ it has a sworn circulation *per issue* equal to that of any *other two* publications *combined*

¶ an analysis of circulation shows that Aero Digest is read in every organization producing or operating aircraft on a large scale and by officers and men in the air service of the Army and Navy

¶ 99% of the large aircraft companies have advertised in Aero Digest in the past twelve months

¶ in this issue of Aero Digest, for example, there are as many paid advertisements as are found in any *three* other publications *combined*

As the rates for advertising in Aero Digest are no higher, the cost of advertising here is less. Write for rates.

AERO DIGEST

220 West 42nd Street New York City

THE CURTISS SEA HAWK

(Continued from page 277)

marked degree. In the F7C-1, perfect vision is attained with no sacrifice of aerodynamic efficiency. Furthermore, and this point is of great importance in shipboard aircraft, the sweepback provides marked stability and controllability at landing angles. Single bay bracing, with streamline steel tube struts and streamline wires, is employed."

"Speaking of bracing," I interrupted, "I could do with a bracer myself." But he only nodded happily and went right on.

"The ailerons are of a new balanced type which compensates against yaw and reduces the rudder movement necessary in turns. Tail surfaces are in general similar to the Hawk, with a balanced rudder and non-balanced elevators. Carefully designed sectors in the control linkage eliminate any slack in the controls."

"You'd burst right out crying if you knew how slack I am at this minute," I said. "I'm practically out of control, and if I don't get my gas tank filled soon I'm going to stall."

"You can hardly stall this ship," he said. "And another interesting thing to note is that the construction of the F7C-1 was started on December 8th, and the first flight test was made on February 28th—less than twelve weeks later. When one considers the advanced nature of the design and the many entirely new features it incorporates, this is an accomplishment that is little short of remarkable."

"And it would be remarkable if I could incorporate a spot of lunch," I retorted, thoroughly aroused at last, for I realized that I would have to take desperate measures if I was to survive. "If I don't eat soon, I'll be forced to take a bite out of that Curtiss Sea Hawk. I could even eat a land hawk this minute. And if a rabbit runs by on the field out there it will have to be a fast rabbit to retain its hold on existence."

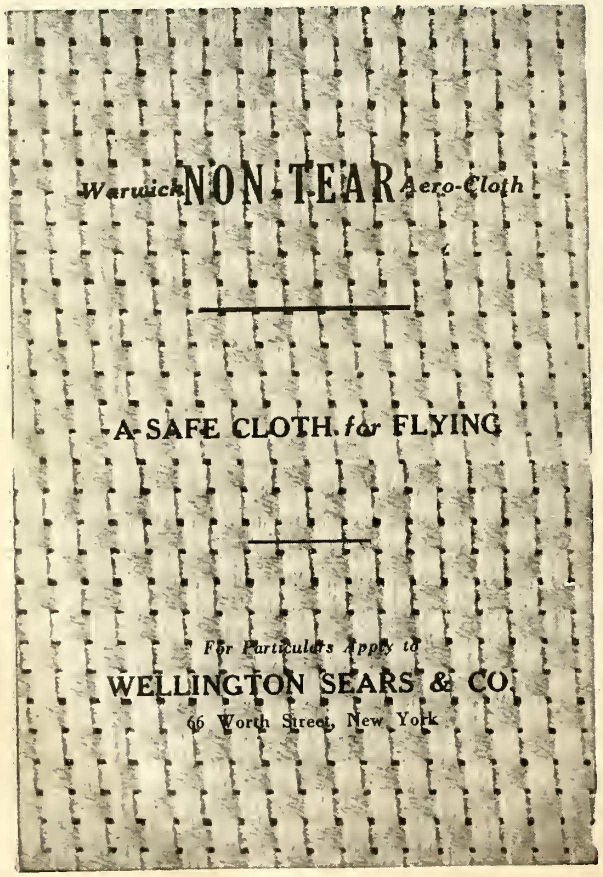
"Oh, are you hungry?" he asked. "We'll go right over."

"Now you're beginning to act human," I complimented him.

Well, I crawled back to the factory office where Mr. Russell invited me to go to his home nearby and sample some Garden City water flavored with fruit juices, as an appetizer—and I want to tell you, that place sure has fine water. It was in cocktail shakers and cut-glass bottles and so forth, with ice and flavoring. There were about thirty of the brightest looking men you ever saw, all sampling the water and saying how lucky Frank was to live in a place where you only had to turn a tap or a cocktail shaker to get a dandy drink. We had little sandwiches filled with caviar, which are fish-eggs that haven't got anywhere, and with anchovies, which are tiny fish that turned out to have not much more luck than the eggs, for they got cut off in their infancy. Then there was cheese for the men who didn't feel strong enough to tackle the caviar. Well, I ate about three dozen of these appetizers, and then Frank took a look at me and decided he'd better get me away from there and give some of the others a chance. So he said, "Cy, I want you to come in and meet the ladies."

Well, there was a time in my life when I'd have left likker for ladies gladly, but I'm getting sort of old now. However, I just said to myself, "Politeness before pleasure; try to act like a gentleman even though you have been handicapped from youth up." So I let him haul me away from the grub and go in to visit the ladies.

Well now, I don't want to say a word against any of



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A SAFE CLOTH *for* FLYING

For Particulars Apply to
WELLINGTON SEARS & CO.
66 Worth Street, New York

Come out for a demonstration in the

EAGLEROCK!

Our hangar doors are open to you. Come over and see us at *Curtiss Field, Garden City, L. I., N. Y.* Call our New York office first and let's make a date! *Gramercy 5299.*

T. D. S. Aerial Service
35 W. 23rd St., New York, N. Y.

Alexander Eaglerock dealers for the states of New York and Connecticut.

those gentlemen there. But I will say this: they must have been just as old and fond of hanging to the water-bottles as I was. For those ladies were absolutely deserted in the library. Not a man was near them—every man was clinging like grim death to that food and drink table. And there was Mrs. Russell and Mrs. Casey Jones and Mrs. Smith and some more I didn't know so well, all sitting around a fire—probably wondering what all the noise in the other room was about.

"Well, ladies," I said. "I'm just here to prove that there's at least one gentleman in the house who won't see you ladies suffering alone. I'm here to keep you company. I've been a martyr all my life, and you've got a good fire here, though I don't see the steak. And I see your glasses are empty, so I'll take them out and replenish them."

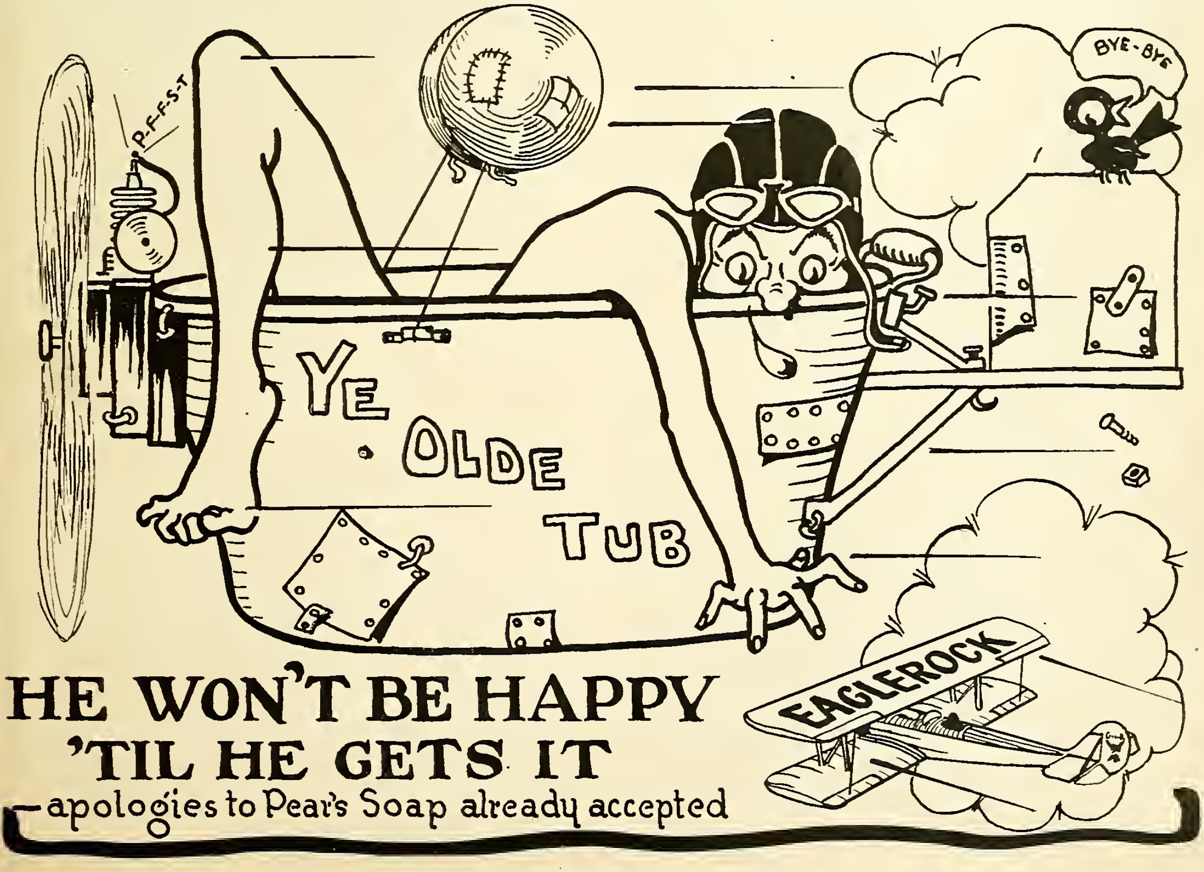
So that's all Frank Russell got for shooing me off the drinks. I went back out with all the girls' glasses and filled them up, and my own too, and went back. And what a party we had! We just joshed each other and kidded around—and I want to tell you, those girls were certainly grateful that there was one man in the house who had a bit of chivalry about him and looked after the ladies, and himself too.

Well, then we all piled out for lunch at the Garden City Hotel, because we were too big a crowd to eat at the house. Besides, there were all us reporters and literary men around—and a man has to draw the line some place. As we drove off I could see Mrs. Russell counting the silver cocktail glasses.

And what a lunch that was! Splendid! I was down at the cheaper end of the table, among the reporters. And I tell you, you have to eat fast with a bunch like that or the meal will turn out to be nearly a total loss. But I kept my end up, all right, and so did C. B. Allen, of the *World*. You should have seen C. B.! You take a guy and feed him at the Automat for a year, and then turn him loose at the Waldorf—that guy is a piker for speed along side of C. B. But I didn't do too bad, myself.

Then there was the handsomest man there you ever saw. I took to him at once. I said to a man near me. "Who is that wonderful-looking gentleman with the gold-rimmed—who is he?" And he said, "That's Mr. Tripp, a director of the Curtiss Company." And I thought to myself, what a fine-appearing man he is—I'd like to know him. What had drawn my attention to him in the first place was not exactly his beauty, but a movement he made. You know, sometimes you're walking in a woods, say, and a movement will attract your eye and hold it—suppose a deer goes past, or a blue-bird—some flash of graceful movement, you know. Well, this Mr. Tripp had made a movement that attracted my beauty-loving eye; he had moved a quart bottle from his pocket to the table.

Now, don't think I was interested in the bottle. I wasn't. It was simply the *movement* of the bottle, so graceful and all, that attracted me to Mr. Tripp. How splendid, I thought, that a man should have such a grace of movement. And, I thought, what a credit to the world a man is who can make a movement like that. And what a loss he would be if he died, and how terrible it would be if he wasn't healthy and due for a long life. So I just leaned over and said to him in my ingenuous way, "I hope you're in good health, Mr. Tripp. I certainly hope so. I'd like to drink your health—if I had anything to drink it in." Of course, he was simply charmed that I should be so interested in him, so—how shall I put it?—so intrigued with his personality. He filled up my glass, and



P-F-F-S-T
YE OLDE TUB
BYE-BYE
EAGLEROCK
HE WON'T BE HAPPY 'TIL HE GETS IT
—apologies to Pear's Soap already accepted

Airplanes-Flying Boats-Motors-Supplies

Dandy new model 40 Aeromarine flying boat complete with new OXX6 motor, radiator and propeller $2550—no nicer condition boat available anywhere. Slightly used Curtiss JN4D —very good condition throughout $975. Good used Canadian Curtiss $750. 2 place OX5 motored TM scout located Illinois $800. Good used JN4D located Iowa $675. New J1 Standard less motor, but converted to receive Hispano $950. Curtiss Oriole—freshly linen covered throughout—dandy condition, less motor $925. Splendid overhauled 400 h.p. newly covered throughout, Liberty motored 4-place Dayton-Wright plane, having a speed of 120 miles per hour. 130 gal. gas capacity—a real money maker $2500.

12-cylinder, 400 h.p. Liberty $1650. Moderately used splendid condition 400 h.p. Liberty $1175. Moderately used completely overhauled 180 h.p. Hispano $550. F.O.B. Atlantic Coast. New OXX6 100 h.p. Curtiss $600 or Navy overhauled $375; moderately used OXX6 Curtiss, excellent condition $300. Good used Curtiss OX motor $250. 2-cylinder, 28 h.p. Lawrance $125. 9-cylinder 80 h.p. LeRhone $125. Slightly used 130 h.p. Clerget $250. New 220 h.p. Hispano $350. New 6-cylinder, 45 h.p. Anzani slightly damaged, easily repaired $190.

OX5 propellers, tractor type: C.A.L. oak, untipped, original box $12.50. Paragon variable pitch $15. Flottorp club type, original box, dandies $25. Toothpick copper tipped, right from original box all perfect condition $25. Hartzell D-5000 walnut metal tipped $35. Metal tipped propellers for OXX6, toothpick $25; Hartzell Liberty club type and Starr club type $35. Pusher propeller metal tipped for Curtiss OX5 and OXX6 $35. Metal tipped tractor propellers for 100 h.p. Gnome $30; for 160 h.p. Gnome $35; for Hall-Scott A7A $15; 150 h.p. Hispano $45; for 200 h.p. Hispano $37.50; for 28 h.p. Lawrance $17.50; Tractor type for 400 h.p. Liberty $25. Pusher type, four blade for 400 h.p. Liberty $75, or slightly used $40. 80 h.p. LeRhone tractor type $20.

150 h.p. Hispano nose type new perfect radiator $90. Liberty 400 h.p. type $55. Hall-Scott 125 h.p. type $40; for OX5 or OXX6, J1 Standard—overhead type $40 or slightly used and slightly jammd but tested for leaks $30. Nose radiators for JN4D and Canuck, new $30, or very slightly used and very slightly jammed on top due to handling but tested under pressure for leaks $20.

Aluminum back, leather upholstered seats for JN4D and Canuck $8. Cushions $2, Standard seat $5, standard seat cushions $6; Safety belt for Canuck or JN4D $3.50; for Standard $4.50. Safety belt used for F boat $3; for HS boat $3.75. Rotary map case—rotates as trip progresses $3.50. Folding mahogany map or paper holder and writing desk $2.75.

Spark plugs: AC for Curtiss, Hispano and others 25c; for Liberty 40c. Mica spark plug for Curtiss, Hispano and others 50c; for Liberty 60c. Spark plugs for rotary motors 75c; for Fiat $1. BG spark plugs $2.50. Mosler spark plugs $2. Spark plug wires with terminal on end each 35c. Terminal for spark plug wires 10c.

Exhibition parachutes, single drop—28 ft. chute $90. Double drop—one 28 ft. and one 24 ft. chute $160. Triple drop exhibition parachute $230. Special web harness for exhibition parachutes $10. Life packs $375. Aerial camera, Thornton-Pickard type "L" with 36 plate holders, takes pictures 4" x 5", 8" fixed focus, new complete in original dandy carrying case $100. Dep (wheel) control assembly for pilot's cockpit $17.50. Flexible oil drain 50c. Hoisting hooks for F or MF Boat $10.

Tail skid assembly (shoe and skid) Canuck, JN4D Standard $4. Wing skid, bamboo or metal $1.50. Wing skid ash for Canuck, or JN4D 75c. Pilot stick, Canuck or JN4D $1.50. Cable, all sizes hard aircraft wire, ferrules, thimbles, shackles, turnbuckles, clevis pins, etc., in complete sizes and types. 100 ft. 16-gauge safety wire 95c. 100 ft. 18-gauge safety wire 95c.

Cotton and linen covers all made up of gov't spec. material for Canuck, JN4D and Standard; gov't spec. cotton cloth 60c yd.; 50 yd. or more 55c; 100 yd. or more 50c yd. Gov't spec. cotton scalloped tape 5½c yd. or 110 yd. rolls 5c yd. Gov't spec. frayed cotton tape 5c yd. or 100 yd. rolls 4½c yd. Ordinary cotton scalloped tape 4c yd. or 131½ yd. rolls 3½c yd. 5-gal. fresh Nitrate dope $9; 25 gal. or more $1.50 gal.; 50-gal. bbl. $67.50. 10" double pointed needles 35c; curved needles 35c. Linen thread 35c per spool. No. 7 rib cord 1c yd. or $3 lb.

New type chamois lined leather helmet $5.50; corduroy lined leather helmet $3.75; all chamois helmet (fold carry in pocket) $4.50; gaberdine helmet $2.50. Italian gogglette $4.25; Cesco curved wide vision $1.75. Non-shatterable goggles; NAK resistal, wide vision $4.50; Jumbo resistal oval $3.25; Triplex wide vision $4; triplex oval $2.50.

All parts for JN4D, Canuck, Standard, OX5, OXX6 and many Hispano, Liberty, Lawrance, LeRhone, Clerget and Fiat parts.

EVERYTHING FOR AIRCRAFT. SEND FOR AVIATION CATALOG.

Try us—The Oldest Established Exclusively Aeronautical Supply House in America.

FLOYD J. LOGAN AVIATION CO.
716 W. SUPERIOR Phone Cherry 949 CLEVELAND, O.

I wished him long life and happiness.

Then Frank Russell called to me from across the table, from the more exclusive part where he was sitting, and whispered, "Cy, tell those reporters to stop eating and we'll go to the field." So I told the boys to put the rest of it in their pockets and come along.

I stuck pretty close to Mr. Tripp—we hadn't used all the bottle—and went along with him in his Minerva car. When a man has a Minerva car you needn't mind drinking his likker from any fear that you'll run him short. Well, at the field old Temple Joyce took up that Curtiss Sea Hawk—I'd forgotten all about the darn thing meanwhile—and put it through the works. And I want to tell you that it displayed the excellent maneuverability qualities which are characteristic of Curtiss fighting planes, and in addition demonstrated its remarkable stability and controllability at stalling speeds. The oleo landing gear functioned smoothly, and the wheel brakes provided excellent ground maneuverability. My friend, Mr. Beisel, commented on that to me, or I might have missed it, for I found it hard to watch the Sea Hawk and Mr. Tripp at the same time, and as between the two my eyes naturally seemed to focus on Mr. Tripp, that wholly charming man.

Then I made an awful mistake. I'd been sticking close to Mr. Tripp and keeping an eye on the Minerva, where the bottle was—for I didn't want anyone to steal the Minerva. But Frank Russell said—he seemed determined to do me some injury—he said, "Cy, will you help Casey with this life raft?" I thought he meant a tray with some cocktail glasses on it, but not so. The plane had landed meanwhile—I hadn't noticed it—and taxied up. Temple got out, and Casey and I climbed aboard.

"Now, gentlemen," said Frank to the assembled multitude, "we will suppose that the plane has landed in the ocean through the fortunes of war. It has received some bullets through a tire and has been forced down into the sea. Casey and Cy are aboard, and are about to save themselves."

Then Casey stood up in the seat, while I stood on the wing. He pulled a handle, and the whole turtle-back, just aft of the pilot's seat, flew open, disclosing a rubber pneumatic life raft equipped with two bottles of carbon dioxide gas in liquid form—they told me what was in the bottles later, and I never forget what is in a bottle. Well, we turned the bottle tops, and they discharged their gas into the raft, which we hurled overboard and into which we leaped—me letting out raucous cries of alarm to heighten the effect. Then we got out two little oars and pulled madly for the shore, kicking up a lot of dust on the field, while the moving picture machines ground away merrily for the news-reels. I waved my hat frantically to attract the attention of passing vessels—I was thinking of schooners at the moment—and yelled to Casey to pull harder as I thought I saw a rum-runner off the port bow. I felt very safe in that little rubber tub, very safe indeed.

Well, we were picked up at last, and I rushed over to Mr. Tripp and told him I was nearly perished after my harrowing experience, so we boarded the Minerva, and—I can hardly write it—the bottle was gone! Gone, ladies and gentlemen! Gone, Mr. Speaker of the House of Representatives! Gone, Your Majesty, and honorable gentleman of the House of Lords!

The Curtiss Sea Hawk yet stood upon the field in all its beauty, in all its grandeur; the crowd yet stood admiring it; the little birds, I have no doubt, still warbled their sad sweet songs. But, oh, my friends, my friends, the —bottle—was gone!!!!

A NOD AND A WINK

(Continued from page 281)

for. This explanation should be sufficient. Besides, I am not sure that he is in full possession of the facts of that evening—if there were any facts. As I look back on them, I hardly dare give them the name of facts. They seem more like theories to me. Casey says, "When I left the hotel to make my train connections the last of the quart was rapidly disappearing." Now, my theory is that it had already disappeared. I seem to recall walking over to the station with Casey. Or I remember being in the station, anyhow, for I recall distinctly my kicking a locomotive, and a policeman saying, "Come away from there—you may break something."

So I'll not try to figure out that evening in any greater detail. But this much I will insist on—all I got was a small drink. That's my story, and I'm going to stick to it.

I GOT quite a shock when I read the gnuspaper heading: LIVING DEAD MAN LOSES LIFE BATTLE. I found that the item referred to the unfortunate young man who had died of internal paralysis. I didn't know the poor sufferer. But when I read that title, LIVING DEAD MAN, I was startled for the moment—for I thought it referred to my poor old paralyzed pal, the National Aeronautic Association, otherwise known as The Coma Kid.

THE Army Air Service—may the saints protect every old Jennie and DH in it!—is making preparations to break the record for altitude and long-range photography. By ascending to an altitude of 40,000 feet, by the help of God and a supercharger, and carrying a newly devised photographic equipment, it should be possible to photograph a scene 300 miles away.

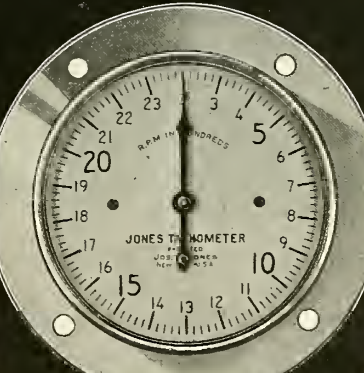
It's only a question of getting up high enough and taking in sufficient area—say three or four hundred miles—when it will be possible to get a photograph of an airplane and the General Staff on the same plate.

THIS little item was hidden away among the real estate ads in the Los Angeles *Times*. I don't know who the hero of the story is, but likely enough he's a member in good standing of the Professional Pilot's Association. It sounds as though it might be Fred Hoyt. Anyhow, here's the item:

> When Eddie Curtiss, the film cutter, was learning to be an aviator at Roger's airport, a rather pert young airman tried to coax him into taking some special lessons.
>
> "I have taught many a young man to fly," he argued, "and so far, I have never had one complaint. Now what does that prove?"
>
> "I don't know," said Eddie, "unless it is the old adage, that dead men tell no tales."

"THE CAMPAIGN OF THE CIVIL WAR," by Walter Geer, which is a concise history of the military operations in the Civil War, should prove of value to the General Staff when they get around to it. It will all be new stuff to them. At present, they've just finished studying "How to use the Bow and Arrow Against Airplanes," by O-how-wet, an Indian chief; and are taking up the perusal of a work on flint-lock muskets used in the war for Independence—say, what happened to that Independence, by the way? I'm down to my last quart.

(Continued on page 346)



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JONES Tachometers are used exclusively as standard equipment by the commercial manufacturers producing the majority of America's aircraft.

Also exclusively by the Navy Department on all airplanes where a circular scale instrument can be installed.

JONES Tachometers have maintained their lead everywhere because they have no equal.

A booklet describing the several types will be sent on request.

CONSOLIDATED
INSTRUMENT COMPANY
OF AMERICA, *Inc.*

41 East 42d Street, New York City

Wilson

ROLLING STEEL DOORS

HANGAR No. 1
BUFFALO AIR PORT
William E. Arthur Company
Engineers and Builders

Modern Equipment is a Vital Necessity for Hangars

Wilson rolling steel doors multiply-operated by electric motors, economical and foolproof, should be standard on all hangars designed to give maximum service.

Pressing a button raises or lowers all curtains simultaneously.

Coiling overhead, out of the way, giving unobstructed opening—save time and temper. Ships can always get away on schedule.

Send for details and data before proceeding with your design

THE J. G. WILSON CORPORATION, 11 East 38th Street, New York City Offices in all principal cities Factories, Norfolk, Virginia

(Continued from page 345)

DID you folks see where the beautiful alabaster sarcophagus of Queen Hetepheres, Mother of Cheops, builder of the Pyramids, was opened and found to be empty? The old lady died in Egypt 5,000 years ago, and it was thought that her mummy was reposing in the sarcophagus. But it wasn't.

Now then, we've got a beautiful alabaster sarcophagus down in White-washington, D. C.—meaning Doubtful Contents—and this fine alabaster doo-dad is called the War and Navy Department. In it is supposed to be hidden a mummy called American Air Defense, which is thought to be of great value—probably as a curiosity.

This mummy was born along about 1918, and died almost at once. But the cadaver is supposed to be resting comfortably in that War and Navy Department sarcophagus. However, when the next war busts open that sarcophagus—or gas—it will be found that this mummy is only a dummy—and a very rummy dummy at that. It might be well to peek into that sarcophagus now, while nobody is bothering us.

FLYING at a hundred miles an hour, Philip R. Love, Robertson air mail pilot, carried $200,000 from St. Louis to Ziegler, Ill., to avert a threatened run on a bank there. I'll tell you what, it's a good thing that bank in Ziegler, Ill., didn't wire for me to bring the money in that old Galloping Goose plane I used to fly, or they'd have been ill indeed. Not only would I have failed to get there in time to avert the run on the bank, but the customers wouldn't have needed to run. They could have walked, and beat me to it. Why, one day I was flying that old purple prune box along into a stiff wind—a wind about forty miles an hour—when I tried to pass a freight train going my way. I couldn't do it. Not only that, the freight stopped and backed up—and still kept ahead of me!

OVER on the Brittany Coast they're using airplanes to drop bombs to kill the belugas, or great white sturgeons, that live on edible fish and ruin the nets of the fishermen. When these marauders are sighted the fishermen signal ashore, and a bombing plane goes to the scene, dropping explosives that kill or drive off the enemy, many of them twenty feet long.

The same tactics could be employed successfully against an enemy fleet that attacked these shores. That is to say, they could be if we could chloroform some of the old shellbacks who control the defense of this nation, and put in their place young and vigorous and thinking men who are able to understand what a real bomber can do. We have a few decent experimental bombers—we have no real ones in quantity. We probably won't have them until the Air Defense is put under a separate head, where it can function unhampered by the moss-backs.

But shucks! Why should I worry myself about this? I get tired of telling those dopes what to do. I don't own any property near the ocean—and I don't own any anywhere else. If anyone attacks New York, I can move. Let the Hebrews worry—they own the place—I only pay rent for living in it.

OF course you were distressed to learn of the deaths of two Army pilots while flying in a fog off the New Jersey coast. I quote from the New York *Times*:

> Colonel Foulois said that the accident emphasized the difficulty the air services have in obtaining weather reports. The only place between New York and

> Washington from which weather reports are received, he said, is Philadelphia, a place which seldom has fog. The only way to learn conditions on the coast is by telephoning the Coast Guard and the Army Air Service has not money enough to do this regularly, he said.

There isn't money enough to pay for a few telephone calls to save the lives of pilots in the Air Service of the wealthy United States of America! And two splendid men have been murdered by the Government of the United States, which couldn't spend a few dollars, or even cents, to find out if the weather was suitable before they were allowed to fly down a coast that is known to be dangerous in the winter! Comment is superfluous.

Then there was the death of Lieut. Cabell, Reserve Corps, killed in an airplane accident in the Gulf of Mexico some weeks ago. Again I quote from the *Times:*

> Mr. Cabell did not describe the young officer's death as an accident. He called it a murder. The young man was "murdered," he said, because he was allowed to fly a plane that was in no condition to be used.

We've had an old slogan, "Join the Navy and see the World." We may now coin another, and possibly more apt slogan: "Join the Air Service—and see God."

THE SIXTY-NINTH CONGRESS

(*Continued from page 274*)

One of the most important sections of the Air Corps Act was framed as a result of this work.

This section covers specifically the way in which aircraft shall be purchased. Whenever new designs are desired by either the Army or the Navy, design competitions must be instituted and broadly advertised so that all who desire may submit designs from which the best will be chosen. Competition is encouraged and directed.

In view of the importance in national defense of a well established aircraft industry, provision was made in the Act for the purchase, without competition, of aircraft which had been developed prior to its passage, and also for the purchase with or without competition of aircraft and accessories for experimental development with the further proviso that if such development resulted in securing this materiel of better kinds, contracts for quantities thereof might also be made without competition.

Heretofore, there has been a question as to the property right of a designer in the designs which he might produce. The Air Corps Act establishes such property rights which goes far to protect the designer and makes it possible for any one, whether or not he possesses manufacturing facilities, to submit designs and to obtain payment therefor in case they prove acceptable. These far-reaching provisions of the Act will do much to insure for both the Army and Navy the best designs for aircraft which it is possible to procure and at the same time will strengthen the existing aircraft industry, and make it better able to respond to a war time demand.

During the first session of this 69th Congress, a total sum of $1,376,000 was appropriated for barracks and quarters at Air Corps stations. Of this sum $750,000 was allotted to Selfridge Field, Michigan; $287,000 to Mitchel Field, New York; $139,000 to France Field, Panama Canal Zone; $200,000 to Maxwell Field, Montgomery, Alabama.

In addition the sum of $1,000,000 was provided for the

(*Continued on page 348*)

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STANDARD J-1 PARTS:
Station 3 and 5 fittings; tail post sockets; control universals; wing root fittings; cockpit cowls; special large O. D. ¼ in. ball shouldered nuts.

MISCELLANEOUS PARTS:
3/16 in. shackles; streamlined wire shackles; JN center sections; JN drift cable eyebolts; Government mercerized cotton; Small turnbuckles, (No. 324 and 325); Reliance tachometer shafts; 20 x 4 tires; 26 x 4 wheels; 26 x 3 wheels and tires; 800 x 150 (32 x 6) wheels.

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The S. S. White Dental Mfg. Co.
Industrial Division
152 West 42nd Street, New York, N. Y.

(Continued from page 347)

continuation of the work for the reëstablishment of the experimental division of the Air Corps on a new site near Dayton, Ohio. McCook Field, where this work has been carried on, is within the city limits of Dayton. The field itself is small, there is a marked element of danger in flying conducted from it. The new site further removed from the city will obviate all of these disadvantages. The flying field will be one of the best in the country, the buildings properly designed will provide all needed facilities for experimental and research work, for the testing of aircraft, engines and all other accessories, and by concentrating the work will enable it to be carried on more effectively and economically.

During the second session of the 69th Congress a total sum of $5,097,000 was authorized, but not appropriated, for the construction of barracks and quarters at various Air Corps stations. Of this sum $122,000 is allotted to Selfridge Field, Michigan; $1,300,000 to March Field, Riverside, California; $906,000 to Kelly Field, Texas; $885,000 to Brooks Field, Texas; $40,000 to Maxwell Field, Alabama; $1,086,000 to France Field, P. C. Z.; $240,000 to Bolling Field, Anacostia, D. C.; $518,000 to Rockwell Field, San Diego, California; and Scott Field, Illinois barracks, $100,000.

The Military Affairs Committees of this Congress did most painstaking work in their efforts to provide adequately for the air defense of the United States. The labor of digesting all of the information laid before them, and their own efforts to obtain additional needed data, resulted in the legislation outlined above, which is believed to have been prepared with great care and which will result in a continuing program, a gradual business-like expansion of the air component of the military forces of the United States and go far toward making it possible to defend ourselves effectively in the air in case we are ever again called upon to take up arms.

AIR — HOT AND OTHERWISE

(Continued from page 278)

noteworthy that last year he proved the military value of this foothold which the Germans have upon this continent by flying from Columbia to Florida, a well known part of the United States, over Central America.

European statesmen of the very highest rank and perspicuity express conviction that the next great international alignment will be Germany with Japan across and including Russia.

The present uproar out in China is almost certainly an enterprise of Russian origin and possibly German-Russian partnership with Japan as a still more silent partner.

And there is a German airline on the very Isthmus scheming for a terminal at the Canal!

Unthinkable—impossible!

Now and then when I am saying things of this sort to my friends within the industry they emit petulant pooh-poohs. Japan, and the Japanese, they say, lack that mechanical sense which makes certain European peoples and Americans really good flyers. And such talk is silly tommyrot.

If Japan lacks ability to produce flyers from among her Army and Navy men she must be importing foreign talent, or perhaps developing the well known high-flying tendencies of geisha girls in a new way, for the Kingdom of the Rising Sun has just bought 172 planes, at a cost of $7,000,000 cash in France.

The 172 actually have been delivered. Orders for a further considerable number, guessed at variously as to totals, are known to have been placed, with the planes now in process of construction in French factories.

For several years Japan has maintained in France an Air Mission. Its members are experts; they watch every new development; they admirably supplement the efforts of the similar and larger group of Japanese in Germany. The Japanese contracts have been carried out by private firms without anything more serious than casual scrutiny by the French Government or America's representatives in France.

The French Government recently completed at San Nazaire a flying boat said to be of hitherto unparalleled flying range. The Japanese are openly interested in this flying boat. Has the private company which carried out the orders for the French Government had any orders from Japan?

Could such flying boats make the various hops required to land Jap flyers on our Pacific Possessions, or at that terminus in the Canal Zone which the German air transport company is endeavoring to arrange as a base?

The French position is peculiar. The nation is upset and has been since Versailles echoed with the "peace without victory" proposals of an American president. France is at odds with Germany—of course. She has heard the rattle of her musketry and had her territory ploughed by German high explosives in vast fields in which her son's bones have been sown. From this planting naturally has grown a crop of fear and hatred which France continually has harvested, generation after generation.

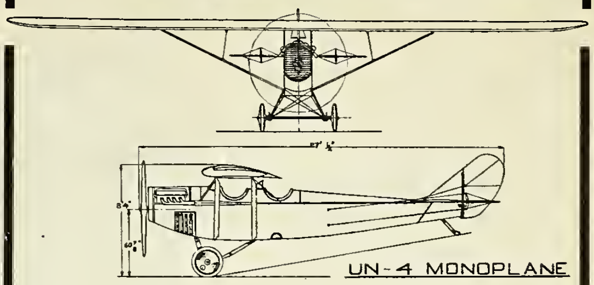
Once Russia's friend, France may be that again—who knows? She probably has no special love for us—nobody has. We stand alone because we are the richest nation in the world—and it is well to bear in mind the proverb: "Rich men have no friends." Russia hates the world and is the one nation which would gladly fraternize and mingle as a fighting force with the deft and rather terrible little yellow-men who swarm in the Pacific Islands and worry as to where they are to put the multitudes of brand new Japanese which constantly spring forth as the result of the world's highest birthrate.

France needs the money. She will sell Japan what planes she needs and we in no wise can complain for all involved are now at peace. France is not as we and the British are—seriously in the present Chinese trouble, which is bolshevik made and led by bolsheviks. But Russia's tremendous air force, recently made clear in AERO DIGEST, is largely officered and flown by Germans, its planes being built by Germans in Russian factories financed by Germany. So Russia has as a source of plane-supply the German factories now functioning effectively in Russia, while Japan uses without question and without being questioned the French factories which are glad to get the orders.

That the Japanese are deeply interested, it is plain, in the giant flying boat recently finished by French engineers at the French factory at St. Nazaire at a cost of just under half a million dollars.

This is the most powerful flying boat the world has ever known and if the Government of France should let the private company which built it sell it and many others like it to the Japanese—what then? Well, we might be a little disconcerted, for the hop from Japan to the Philippines would be a joke for it and the hop from Manila to Honolulu and thence to our Pacific Coast would be by no means utterly beyond its possibilities—though Mr. Secretary of the Navy Wilbur's recent speech in Chicago showed that he felt otherwise.

(Continued on page 350)



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IMMEDIATE DELIVERY ON NEW SHIPS. SERVICE AND PARTS

(Continued from page 349)

Russia and Germany, it is virtually certain, have a fine secret understanding. A German airline is applying for that base close by the western terminus of the Canal. These Japanese are bidders for that mighty flying boat. Germany, across Russia, to Japan—and thence where? And Germany with a landing privilege close to our Canal!

These things suggest the reasons why I think that AERO DIGEST's efforts to keep America enthusiastic over aviation and to keep American aviation energetic, clean and enterprising are among the most important which we could make.

Wonderfully fine reasons exist why all air-minded Yanks should work by day and dream by night of their great job. When here in this office we get earnest it is because we know these things. We shall keep on getting earnest, being anxious to advance American aviation, impatient with all those whose activities seem likely to retard it and with those whose indolence seems likely to accomplish a like purpose.

WE are not the only people who are worried over a general national indifference to the fact that warfare has been wholly changed since the Armistice and that any nation's safety, must rest on air preparedness. Colonel D. P. Bloch, of the French Army, looks over a situation in his nation which is infinitely better than anything we have to show, but he trembles when he thinks about the definite and dreadful peril which he sees it indicates for France.

The unemotional and technical treatise which Colonel Bloch presents to his countrymen declares that the next war will be virtually wholly one of aircraft and of gases. Not merely areas close to the front, but whole nations, will be actively engaged. There won't be any front, or, rather, there will be nothing except front. The woman and child in the interior will be in quite as desperate danger as the man upon the border. Towns and cities will be suffocated if an enemy breaks through with airplanes, gas-bomb laden.

"There will be no safety except behind a gas mask and then only till the enemy discovers the especial chemical which will penetrate that gas mask.

"Trenches will be useless; attacks will be on cities far from boundaries, on all industrial centers, on agricultural regions where food is grown, herds and tillers of the soil being wiped out by odorless, invisible chemical fumes dropped from planes so high that from the earth they will be invisible though flying in the most cloudless sky."

That France does not consider Colonel Bloch a dreamer is evidenced by the fact that the new French law just promulgated (not just proposed by some "militaristic crank") provides for the mobilization of the whole nation, not merely its able-bodied men, for war service upon a moment's notice.

All ages of French males, and women and children, will be amenable to military service from now on—which means they will be subject to rigid discipline and ordered to join vigorously in team-work, for which all are to be trained, each in accordance with sex, age, strength, intelligence and special aptitude.

War and the danger of war are real to France. She knows many things we of the United States do not know. May we never learn these things by terrible experience! France realizes there CAN be no non-combatants in the next war. She knows that air MUST be its theatre!

Colonel Bloch reveals the fact that had the last war lasted a few months longer than it did Paris and London would have had fire rained upon them by the Germans.

from the invisible upper reaches of the sky. Destruction would have been inevitable after that sharp shower. The tiny bombs, entirely inflammable, would have penetrated thousands of city roofs at once and each community would have been a universal blaze of flame.

"It will be easy," Ludendorf predicted as he told about this plan, "to set thousands of buildings on fire at once with these, and thus drive everyone into the street. Then a similar rain of gas bombs may kill everyone at once. Gas from which not even gas masks could give safety can begin the work and will be moved by winds. A rain of small 'intoxicating bombs,' will then render the whole population incapable of flight."

Flocks of planes, says Colonel Bloch would constantly have flown over in accordance with this plan—small, hard to reach with anti-aircraft.

The only defense for such an attack as that would be by airplane against airplane—fleets against fleets. If the whole human and animal population could not be provided with bomb-proofs and gas-masks far more efficient than anything now known, destruction of all life would still be inevitable unless air defense were adequate to keep off air attack.

ONE swallow cannot make a summer nor one pair of golf pants an air expert. New Haven, Connecticut, achieved an Air Board and was happy. This broadcasted what it was going to do, but, in fact, it did nothing except broadcast and appear importantly in golf pants at golf clubs with golf implements.

But the good Lord has a taste for nutmegs and therefore doubtless went to the salvation of Connecticut's intellectual and football metropolis by planting there two real and practical air enthusiasts, the brothers Jack and Charlie Tweed. Boss Tweed once played the deuce with New York City. The Brothers Tweed, upon the contrary, were angels in disguise there in Connecticut and golf pants were no part of the disguise. There were just folks entirely without short knickers; plus four eloquence unbacked by works distressed them.

They had no organization, a fact which they regarded as an asset when they saw the masterly inactivity of the men who had behind them the New Haven Air Board.

Thus the situation stood there in Connecticut when in the fall of 1926 these brothers Tweed decided that they would organize an air meet at the New Haven Air Terminal, which previously had been a name and only that.

Far from rich men they spent their personal money for the purpose which they had in mind and also spent energy and brains. These, too, their own. Among the things (besides golf pants) they did not have was knowledge of the National Aeronautic Association politics.

The result of these activities of the mere Brothers Tweed was a gathering of more than 40,000 interested spectators who at that hand-made meet discovered for the first time such things as airplanes in which men really can fly actually exist. This previously had been doubted in Connecticut partly because the New Haven Air Board never had regarded it worth while to prove it.

Thus two young men of energy and patriotism, of initiative and enterprise, did more in a few weeks than all the guff and blah and membership exclusiveness which had emanated from the chairman of the city Air Board (splendid in his golf pants though he was) ever had accomplished or ever could accomplish.

We like to raise our hats to the two Brothers Tweed. There are such men in your city. Encourage them—they deserve it.

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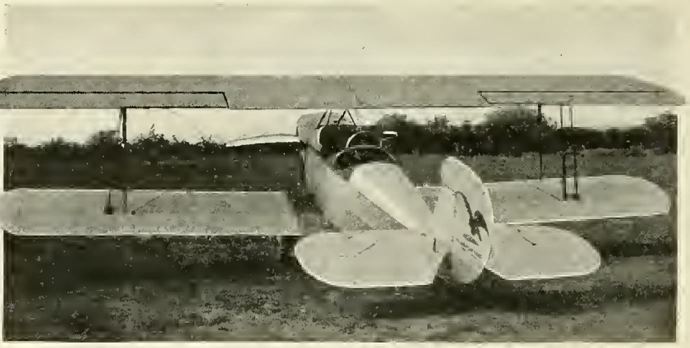

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SUPER-AVIATION

(Continued from page 282)

As far as pilot and passenger are concerned, a well heated hermetically sealed cabin with constant supply of fresh oxygen would solve the problem, provided they can stand the possible variation in speed. If the problem of the glider unit (plane without the power plant) is not too complicated, the source of power and means of propulsions are rather involved. To obtain full benefit of high altitudes the speed must increase proportionally to the decrease in relative density for the altitude of the plane. This however requires a proportional increase in power.

With the density of air decreasing with increase in altitude the ordinary aircraft engine behaves just in the opposite way. Without going into technical details, the main reasons for such behavior are as follows: The total volume of air sucked by the cylinder is somewhat constant and with decreased density at altitude the total mass of air is decreased. Therefore the amount of fuel which can be burned is also decreased. As a result the power of an aircraft engine drops with increased altitude. This drop is even faster than decrease in density for other reasons.

As a result the airplane with a normal aircraft engine has its "ceiling"; that is, the maximum altitude at which the power of the engine is sufficient only for level flight at a single speed considerably below the high speed at sea level.

Engineers' efforts so far are directed toward obtaining at altitude the same power as we get at sea level. The improvements are concentrated on the ordinary type of air-cooled engines but there are other possibilities of generating power and obtaining desired propulsion. They may seem radical and there are technical difficulties awaiting us no doubt, but the hope of super-aviation lies in them.

PILOT'S PHYSICAL TESTS

(Continued from page 284)

Quite as nicely arranged and marvelously functioning a mechanism as the eye is the ear, which gives not only hearing but equilibration. A lobster inserts a tiny pebble into a cavity and gets equilibrium. If we remove the pebble, insert an iron filing and then use a magnet we can make a contortionist of the lobster. Evolution, if there is such a process, has brought us to something much more complicated but more effective. There are the external and middle ears, which have to do with hearing, and the internal ear for equilibrium. The drum membrane receives the oscillation of the sound wave, transmits it to three tiny bones or ossicles, the hammer, the anvil, and the stirrup, smaller than a granule of wheat, yet jointed together as perfectly as are the bones forming the knee joint. These set up a wave in a fluid which affects the terminal plates of the nerve of hearing, arranged to receive waves in certain lengths or frequencies.

Within the bony structure of the internal ear are three tiny semicircular canals, each one connected with the other but placed in three different planes. Each canal is lined with a delicate membrane containing the end plates of very sensitive nerves and partly filled with a serous fluid. They are less than a half inch in total diameter, and tiny as a hair in its internal cross section. As gravity moves the fluid within them the nerves sense its movement and translate this sense to the brain, giving information as to the position of the head. This, together with the function of the nerves of muscle sense which continually tell the brain of the position of the voluntary muscles, gives the sense of equilibrium. Since the function of

(Continued on page 354)

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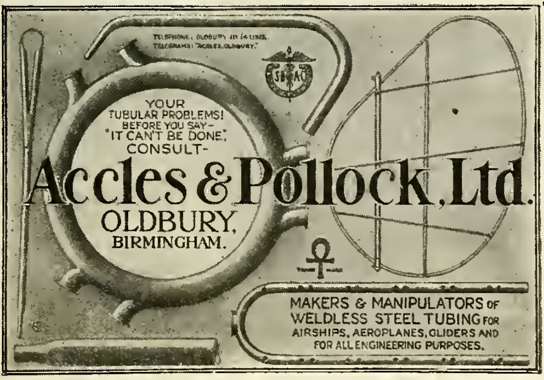

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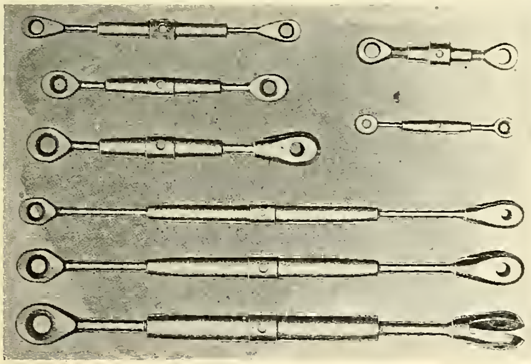

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(Continued from page 352)

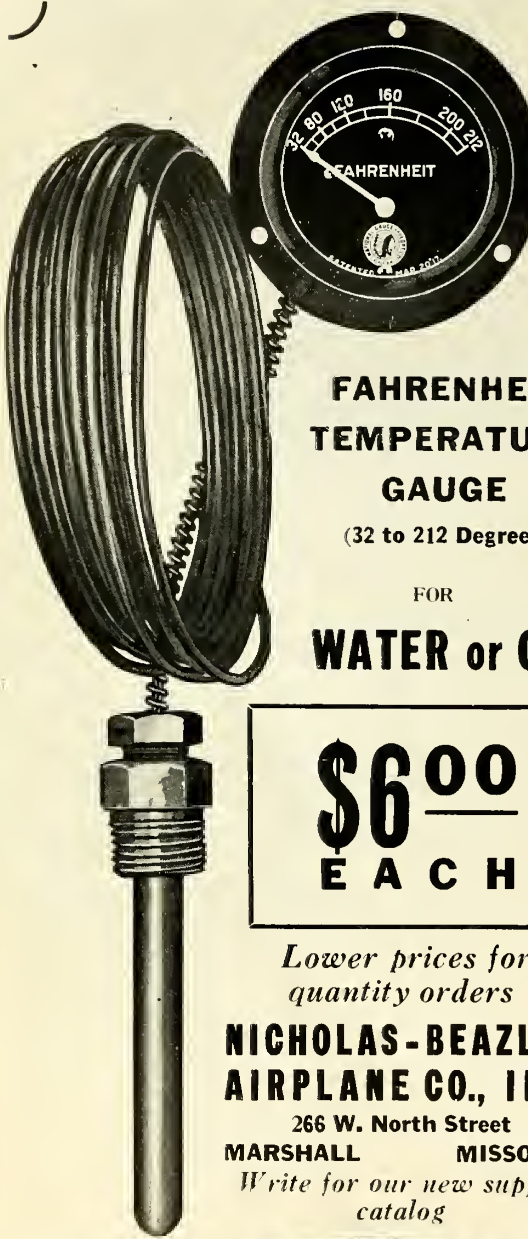
hearing could not be good unless the pressure were uniform on both sides of the drum membrane, the Eustachian tube provides the middle ear with atmospheric pressure by connecting it with the cavity of the nose. This also permits the various accessory cavities of the skull, also connected with the nasal cavity, to serve as sound amplifiers.

Section 18 tests the hearing with the whispered voice after the physician has completely exhaled, beginning at 20 feet from the applicant and slowly approaching, repeating a series of numerals. The distance at which they are first recognized is taken as the basis of measurement. Transport pilots must hear at 8 feet—8/20 hearing; other classes at 3 feet. Since almost any disease affecting the inner mechanism has an effect upon the drum membrane, even a mere sealing off of the Eustachian tube, and since the drum is readily accessible for examination and the inner structures are not, a normal drum is accepted as evidence of an open tube and of normal inner structures. This normal condition, however, is required in all three classes. Any abnormality in the drum will of course indicate further examination and study to determine the exact cause. Any acute or chronic disease of the middle or internal ear disqualifies all classes. This, of course, is because of the great importance in flying of a proper sense of equilibrium.

Section 19 lists a number of conditions of nose and throat that interfere with free respiration and oxygenation—important at altitude—such as obstructing malformations like deviated septa in the nose and various diseases like chronic nasal catarrh. The first two classes for any of these are disqualified. However, correction may be made, if possible, such as removal of enlarged tonsils, etc. The Private pilot is let off surprisingly easy by the remark under Nose and Throat, "No Requirements." He needn't have any nose or throat.

In Section 20 equilibrium is tested very simply—at least in comparison with the whirling chair in the army—by simply having the applicant stand unaided on each leg alone, eyes closed, for fifteen seconds. Three trials are given. No requirements are laid down but an unsteady result would lead to further study to determine the cause.

Sections 21 to 31 inclusive deal with the general physical examination. I will mention briefly the chief disqualifications: such general diseases as sleeping sickness, malaria, syphilis, asthma (for obvious reasons); certain deformities of skull and spinal column; disease of the thyroid gland (as goitre, for its effect on the heart action); deformities of chest wall interfering with respiration, and diseases of the lungs interfering with oxygenation. The heart and blood vessel system is very completely covered, but with



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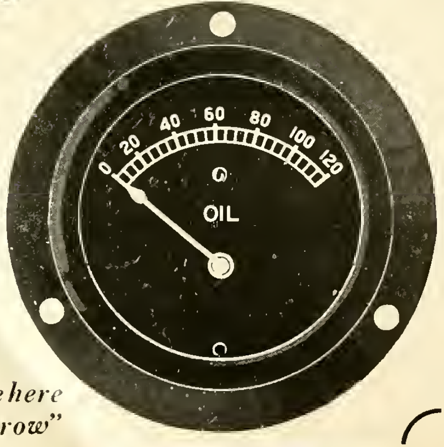

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(See report of Government tests)

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every possible consideration for the applicant. For instance, the examiner must bear in mind that the excitement of the examination may speed up the heart action, and that this should not be a cause for rejection; and it is prescribed that no single reading of the blood pressure will disqualify. Valvular disease, enlargement or inflammation of the heart, disqualify, as do various types of disturbance of the heart's rhythm. Generalized hardening of the arteries, and blood pressures excessive for the age reject.

The abdomen is thoroughly covered, and any condition that might under stress produce a sudden abdominal crisis, or excruciating pain is a cause for disqualification. For instance, ulcer of the stomach or intestine sometimes ruptures and usually renders the victim instantly unconscious. Hernia, or "rupture," sometimes suddenly protrudes through an abnormally large opening in the abdominal wall, and this is always accompanied by sudden and violent pain. A few conditions, such as chronic appendicitis and enlargement of the liver, if mild in degree, will not disqualify a Private pilot. All will eliminate the other classes, but some can be corrected by surgical procedure.

The genito-urinary system is similarly studied, and any grave disease such as Bright's disease, diabetes, kidney stones, syphilis, and gonorrhea, the latter if chronic and without symptoms excepted, disqualify.

Various deformities in the extremities interfering with function disqualify. Full motion is required in shoulder, hip, and elbow, while partial loss of movement in other joints is permitted to certain degrees. For instance, one wrist may have only a quarter of normal range if the other has at least three quarters, but complete stiffness in either rejects a man. Chronic dislocation of a joint rejects, and at least two fingers and the thumb are required on each hand. Chronic swelling of a limb, and neuralgias such as sciatica disqualify. The Transport pilot must not have a tic or painful nerve condition, usually occurring in the nerves of the face, very painful and sudden in onset.

Sections 32 and 33 discuss the nervous and mental requirements. Examination of the nerve system is by the ordinary methods of studying the action of the pupils of the eyes, reflexes of the tendons (striking the tendon below the knee) and testing the station while standing and walking, eyes closed, etc. Naturally any disorder of the central nerve mechanism rejects a pilot from all classes.

The mental examination is really a complete psychological study of the individual—a psychoanalysis. It can be made only by a physician or psychologist who has been trained in the analysis of personality and in neuro-psychiatry, or mental disease. To many I realize this seems superfluous, and yet it really is the most important part

(Continued on page 356)

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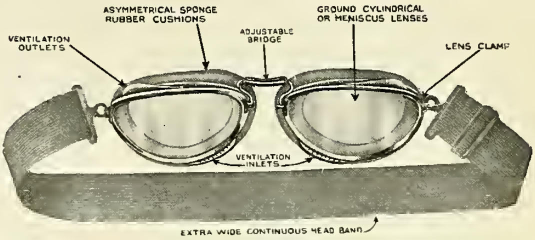
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(Continued from page 355)

of the examination. A study of a large series of crashes in the Royal Air Force showed 8 per cent to be due to mechanical failure in the machine, as a wing off or whatnot, and 92 per cent due to some disability in the pilot. Of these latter, 65 per cent were due to a psychological unfitness to fly, rather than to a physical handicap.

The last Section—34—of these regulations covers the semi-annual examination of the Transport pilot, which is simple compared with the regular annual one. Simply acuity, depth perception, and balance in the eye, gross disease in the ear, nose and throat, and pulse rate before and after exercise to determine the efficiency of the heart muscle, urine analysis, and general evidences of a nervous breakdown. The same requirements hold in each of these as in the annual examination.

I trust that this crude discussion will have made it easier to understand the point of view of those who formulated these regulations, and will augment the appreciation for the splendid effort that they represent.

THE NEXT PARADE

(Continued from page 273)

pushed and fought in ever increasing numbers. A crawling cancer of human life. Where it thickened and fought most fiercely, the marines from their windows and house tops pulled their grenade pegs and let drive, to clear the way. A bark and a sheet of yellow flame—a space for a moment—then the back surge and the riot was on again. "America? America be damned! We gotta get *away.* We'll be bombed soon now. An' *gas*——"

And one policeman presently got his hands on the grips of a machine gun. He was naked to his sweaty waist. One of his eyes was pulped into a wet mass, and his flesh was torn by a thousand dirty nails. Hate—*hate.* Years of hate. "Holy Mary Mother o'God. Holy Mary Mother o'God!" Over and over again. Meanwhile his white thumbs pressed the trigger-trip as they had once before in the Argonne, and the gun danced drunkenly on its uneven tripod. He silenced Barclay Street from Broadway to West Street and went on firing into the swathes of bodies. A marine touched his shoulder to stop him. The shoulder was cold—but the head still stared sightlessly along the hot barrel of the spitting gun.

In little knots all over the heterogeneous city, the patrols held out, trying their best to keep order—but New York had never known its neighbor let alone loved him. So New York trampled and clawed and shrieked and the Gen-

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eral and the Adjutant could do nothing. Communication was cut off for the simple reason that the patrols had no spare men to waste on telephone duty. Every man was needed at a gun. Every man stayed at a gun—till he died.

And presently the lights over the city snapped off—and on again. And again off—and on. And then off. A roar rose in the darkness—a roar that echoed through the street canyons—

(The concluding installment of this fascinating narrative, in next month's Aero Digest, *graphically describes the horrors of an air bombardment of New York.)*

FLIGHT TRAINING—THE STUDENT

(Continued from page 286)

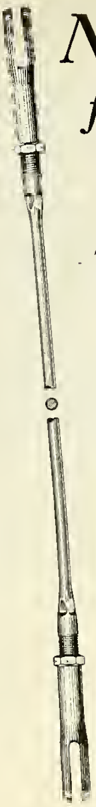
tion of doing the right thing. The Air Commerce Regulations impose this obligation on interstate commercial pilots. Morally, even though not legally, the private pilot is equally accountable. The student undertaking flight training must on completion of it be ready to assume this responsibility, if he is going to carry anyone besides himself.

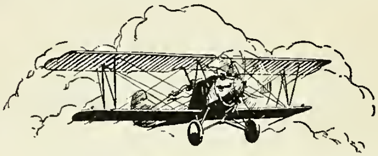
The requirements of flying are high, but they are by no means beyond the capacity of the average physically and psychologically qualified man. To meet them requires simply the expenditure of the necessary time and effort. And when they are met, the opportunities that open out will be found ample compensation for the painstaking practice required during training.

For the man who wants to fly purely for the sake of flying, no sport can compare with it. There is exhilaration in the spirited response of a well-built plane, in the quick whir of the motor, the rush of wind, and the lift of mounting wings. The boundaries of nature drop away into insignificance as city or country, mountain or lake, forest or farmland pass beneath with equal ease.

To the man who is considering flying as a profession, a wide range of opportunities is offered. Commercial aviation is in its infancy. It is growing rapidly, and with its growth the need for trained pilots will expand proportionately. Half-trained men who may or may not bring a plane in safely are not wanted. The professional standards required of a pilot must be high, for the lives of his passengers depend directly on his skill. They can be met only by the intelligent, dependable man who will recognize flying as a highly skilled profession, who will make the effort necessary to acquire adequate training and who will give the careful and serious attention to his work required to insure safety. But to such men aviation holds out generous opportunities.

The remaining factors in flight training will be taken up in the succeeding article in the April issue.





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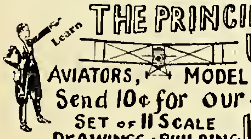

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